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No. 13.

ON TO THE ATLANTIC.

VESSELS WITH AN AGGREGATE CARRYING CAPACITY OF 69,500 TONS AND AN INSURANCE VALUATION OF \$1,184,500, TRANSFERRED FROM THE LAKES.

The past week has seen the consummation of the deal whereby the Atlantic Transportation Co. of New York has secured, through the agency of its manager, Mr. Walter S. Besse, and J. C. Gilchrist of Cleveland, the transfer from the great lakes to the Atlantic coast of four steamers and thirty-nine barges, with an aggregate carrying capacity of 69,500 tons and an insurance valuation of \$1,184,500. All of the chartered vessels have already started for the St. Lawrence, and the plan is to have them reach Montreal by the 15th inst., although there is some doubt as to the accomplishment of this purpose.

The Review presents herewith the full list of the vessels chartered, together with the carrying capacity, insurance valuation and owners' names. The project for the transference of these vessels to the coast, which was for a time regarded with some skepticism by many of the lake owners, has gradually come to be more favorably considered. One incident which has aided this impression is found in the promptness with which the representatives of the Atlantic company paid the charter price for the first month's service. On the other hand, shipping and ship building interests on the Atlantic coast, which were at the outset decidedly apathetic regarding the effect of this accession of tonnage, have in some

LAKE VESSELS CHARTERED TO ATLANTIC TRANSPORTATION CO., OF NEW YORK.

STEAMERS.	Capacity net tons.	Insurance valuation.	CHARTERED FROM.
Aragon.....	2,500	\$100,000	C. R. Jones, Cleveland.
Lindsay.....	1,700	68,000	C. R. Jones, Cleveland.
Katahdin.....	2,200	100,000	H. W. McCormick, Bay City.
Murphy, S. J.....	2,200	100,000	L. H. McCormick, Menominee.
BARGES.			
Foster, Chas.....	2,000	25,000	J. C. Gilchrist, Cleveland.
Georger, F. A.....	1,700	18,000	" "
Alverson, H. D.....	1,500	18,000	" "
Moonlight.....	1,500	17,000	" "
Crothwaite, W. S.....	1,400	14,000	" "
Sheldon, T. P.....	1,300	14,000	" "
Bacon, M. S.....	1,300	18,000	" "
Watson, S. L.....	1,200	12,000	" "
Foster, S. H.....	1,300	16,000	" "
Verona.....	1,400	15,000	" "
Camden.....	1,400	15,000	John F. Wedow, Cleveland.
Halloran.....	1,500	16,000	Thomas Murphy, Cleveland.
Massasoit.....	1,200	14,000	Leander Burdick, Toledo.
Sage, H. W.....	1,500	20,000	John Kelderhouse, Buffalo.
Redwing.....	1,500	16,000	A. A. Parker, Detroit.
San Diego.....	1,500	16,000	A. A. Parker, Detroit.
Iron State.....	2,000	30,000	J. W. Millen, Detroit.
Iron City.....	1,200	22,500	J. W. Millen, Detroit.
Watson, S. V. R.....	1,000	10,000	Byron Whitaker, Detroit.
Parker, Thos. L.....	1,200	20,000	C. W. Elphicke, Chicago.
Wadena.....	2,100	35,000	Mack-Becker fleet, Cleveland.
Becker, W. D.....	2,100	48,000	Mack-Becker fleet, Cleveland.
Ash, Annie M.....	2,500	46,000	Mack-Becker fleet, Cleveland.
Checotah.....	1,400	16,000	Alvin Neal, Port Huron.
Wallace, David.....	1,800	27,000	David Wallace, Lorain.
Wall, Charles.....	1,200	9,000	C. R. Jones, Cleveland.
O'Neil, John.....	1,200	10,000	C. R. Jones, Cleveland.
Brunette.....	1,400	12,000	" "
Shawnee.....	1,200	10,000	J. W. Westcott, Detroit.
Hawgood, H. A.....	2,300	42,500	Hawgood & Avery, Cleveland.
Ewen, F. D.....	1,900	32,500	" "
Fitzpatrick, J. C.....	2,400	55,000	Thomas Fitzpatrick, Cleveland.
Metacombet.....	1,500	18,000	Inter Ocean Trans. Co., Milwaukee.
Rutter, J. H.....	1,800	25,000	Thos. Adams, Detroit.
McGregor, Wm.....	1,500	17,000	Northwest Trans. Co., Detroit.
Brown, H. H.....	1,500	17,000	" "
Porter.....	1,500	16,000	C. A. Chamberlin, Detroit.
Helvetia.....	1,600	18,000	H. J. Johnson, Cleveland.
Page, M. W.....	1,400	16,000	V. Fries, Milan, Ohio.
	69,500	\$1,184,500	

degree been aroused, now that its actual consummation has been recorded. Schooner owners and agents on the coast express the fear that the transfer of this large number of barges from the lakes will ruin the schooner business, and in justification of their opinion point to the number of coastwise vessels which have been laid up on account of freight rates.

In coal transportation circles in the east there has been much speculation as to the intentions of the company, and all sorts of rumors have been in circulation, but without either verification or denial, as the officials at the New York office of the Atlantic company have steadily refused to give out information. The Atlantic company is known to have been endeavoring for some time past to secure tonnage, and one of these rumors credits it with the purchase of nearly all the vessels of Morse & Co. and Tracy & Co. of New York, while not only has the entire fleet of the Boston Towboat Co. been chartered, but overtures are claimed to have been made for the tugs of Lewis Luckenbach. The four-year contract which the Atlantic company holds, and reference to which was made in the Review last week, is with the Chesapeake & Ohio Railroad Co., and is for all that portion of their output of coke and various kinds of coal which goes to eastern markets.

Vessel men on the lakes have in some instances been surprised by the statement that the older wooden vessels, such as have been chartered, although in some cases unable to secure insurance of any kind on the lakes, would have no difficulty on that score on the Atlantic coast. That such is the case is due to the route on which the vessels will be placed. From Newport News, the terminal, to Delaware breakwater is only 110 miles, and from Delaware breakwater to New York is only 125 miles. Above New York, the vessels can for a considerable portion of the distance make use of the "inside" route, passing between Long island and the mainland. It will thus be seen that the course is a remarkably safe one, whereas these vessels, when engaged in lake trade, would be obliged to make runs very

much longer and decidedly more hazardous. Some 250 or 300 men will be required to man the vessels going to the coast. In almost all cases the captains who have been on the vessel will be retained. Most of them are quite as pleased with the prospect of winter work as is the owner with the opportunity to draw checks for the use of his vessel during the months when, had she remained on the lakes, she would have been laid up. There is some doubt about two or three of the chartered boats, notably the Checotah and Brunette, being gotten ready in time or for other reasons being unable to fulfil the contract stipulations.

In referring last week to the new barges building for the Atlantic company at Bath, Me., the Review inadvertently stated that the boats were under construction at the Bath Iron Works. The misstatement is, corrected in a letter from William Rogers, the well-known Bath ship builder. Mr. Rogers writes: "Your statement in the last issue to the effect that four vessels are building at the yard of the Bath Iron Works for the Atlantic Transportation Co. is an error. I have during the year built for the Atlantic Transportation Co. the barges Kentucky and West Virginia and have on the stocks and nearing completion the Virginia and New York, each of 3,000 tons capacity, and all to be completed this season. You will therefore understand why we feel an interest in what is coming from the lakes to enter into competition with the wooden product of Bath ship yards, and this was my reason for asking the dimensions of the largest vessel which can pass through the canals. Thanks to your Blue Book, I have been able to ascertain this information."

VESSEL MEN ARE PLEASED.

THE FREIGHT SITUATION IS IN THEIR FAVOR—CAPACITY OF THE FLEET THAT GOES TO THE EASTERN SEABOARD.

The season of navigation is closing to the entire satisfaction of the vessel interests. The volume of business will again be largely in excess of previous years, and conditions attending the closing months of the season are such as prompt activity in the ship yards, not only in repairs but also in new ships. The Atlantic Transportation Co. of New York takes forty-three ships (thirty-nine barges and four steamers) from the lakes to engage in the coal trade on the Atlantic coast. The combined capacity of these vessels is 69,500 net tons. They are all vessels of the past in the matter of earnings when compared with the modern steel ship, but they were nevertheless a factor in lake freights. A conservative estimate as to their capacity for a full season is 1,251,000 net tons of freight. This is based on eighteen cargoes in a season for each of the vessels, and that number of cargoes is undoubtedly low when the steamers are taken into account, and when it is understood also that several of the barges—those of the Mack-Becker fleet, for instance—were so engaged that they would carry nearly double that number of cargoes in a season. The loss of these vessels will be felt especially in the coal trade at the so-called out-of-the-way ports, and in the ore trade at places like Tonawanda, at all of which ports modern dock machinery must be provided to care for vessels of a larger class that will take the place of those leaving the lakes.

The advancing of freight rates, due mainly to a large grain crop, have more than equalled the expectation of vessel owners. Chicago has taken care of all vessels offered for nearly a month past at grain rates based on 13½ cents for corn to Buffalo, and on the northwestern wheat crop, moving through Duluth, a rate of 2¼ cents to Buffalo has been well maintained. Contracts covering 2,000,000 bushels of Duluth and Fort William grain, to be moved to Buffalo during the first half of November, were made in Duluth a few days ago at a 2½-cent rate. It was said that 1,000,000 bushels of this grain was taken by the Bessemer Steamship Co. (Rockefeller fleet), but the management of that company would say nothing on the subject when inquiry was made regarding the transaction. September ore shipments were about 200,000 tons short of shipments in September of last year, and it is now evident that the output of 14,500,000 gross tons of ore for 1898, figured on some time ago, will not be reached. A general shortage of mining labor in the Lake Superior region and high grain freights are the causes of restriction in ore. The output will probably not exceed 13,500,000 tons. There is satisfaction in the shortage to both ore and vessel interests, however, as it means reduced stock piles on Lake Erie docks next May. Rates on ore up to this time have been held down to 75 cents from the head of Lake Superior, 60 to 65 cents from Marquette and 55 to 60 cents from Escanaba, but at these figures, which are lower than the grain rates, the ore shippers have secured only a small part of their share of vessel capacity during the past ten days. It is more than probable that quite a little chartering could be done from the head of the lakes at 80 cents if vessels were to be had at that figure.

W. R. Trigg's Ship Building Preparations.

Mr. W. R. Trigg of the Richmond Locomotive Works of Richmond, Va., who recently secured the contract for several torpedo boats and torpedo boat destroyers, is going ahead energetically with preparations for the fulfillment of his contracts. He has taken temporary quarters in the Richmond Chamber of Commerce building and is superintending the preparation of preliminary plans for the new buildings and launching ways for the plant. Mr. J. O. Nelson, constructor, and F. E. Pratt, who has been in the government employ for several years, will be among those associated with Mr. Trigg. They are already giving their entire time to the new enterprise. The intention is to provide buildings and machinery that will be of the character required for a permanent ship building plant. The engine work will be done at the Richmond Locomotive Works.

Capt. C. E. Benham has been appointed deputy collector of customs at Cleveland.

LAUNCH OF THE ILLINOIS.

ANOTHER FIRST-CLASS BATTLESHIP FOR THE UNITED STATES NAVY GLIDES INTO THE WATER AT THE YARD OF THE NEWPORT NEWS SHIP BUILDING & DRY DOCK CO.

The Newport News Ship Building & Dry Dock Co. on Tuesday launched the third first-class battleship that has been put into the water at its yard at Newport News, Va., since the first of the year. No American ship yard ever made a more favorable showing, and the credit which re-

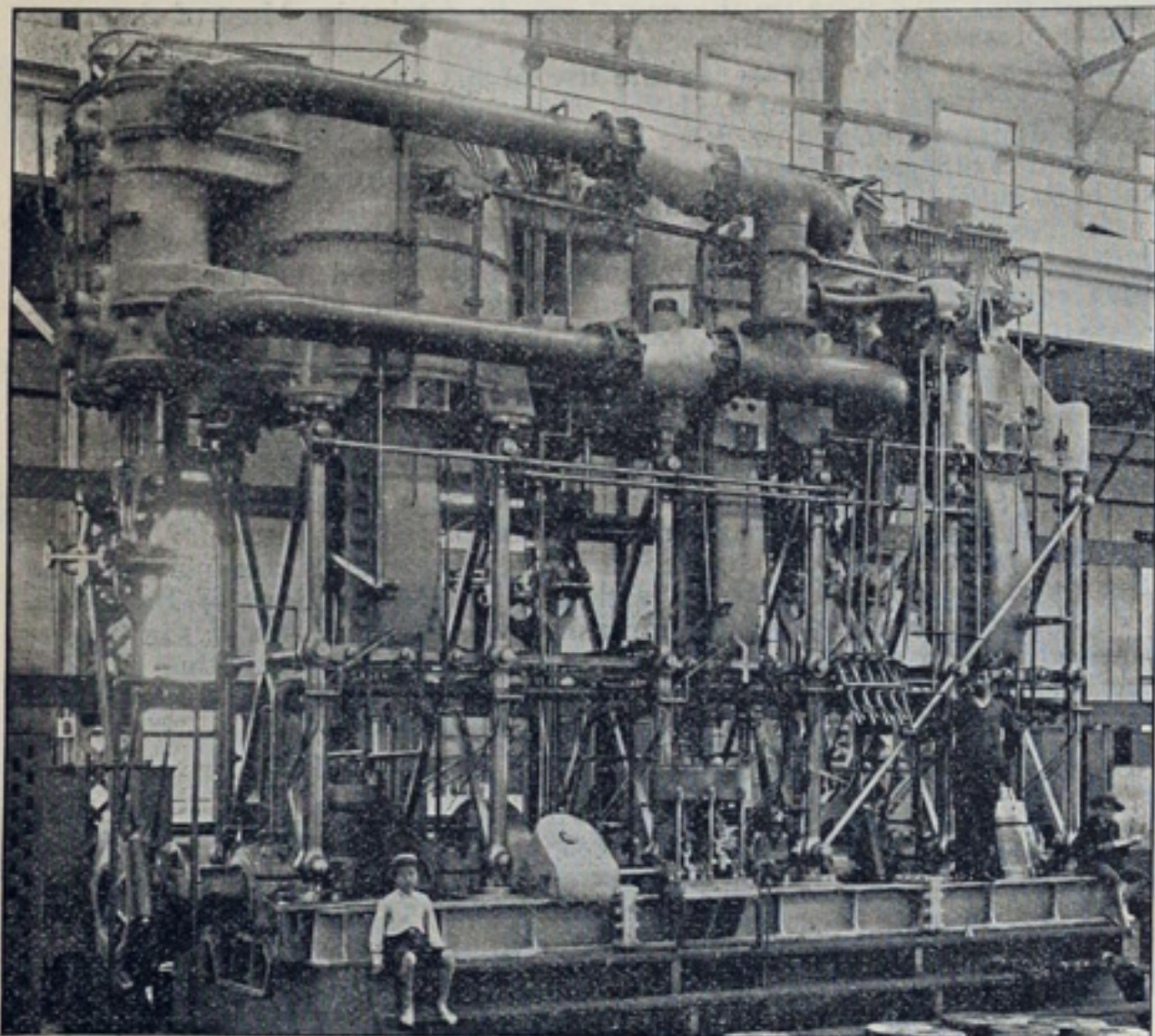


Photo by
Rusk & Shaw.

PORT ENGINE OF THE BATTLESHIP ILLINOIS.

dounds to the institution is all the greater by reason of the fact that previous to undertaking the building of the battleships Kearsarge and Kentucky the Newport News company had not engaged in battleship con-

presence of a crowd that was estimated to aggregate 20,000 people. The launch was witnessed by Assistant Secretary of the Navy Allen, Governor Tanner of Illinois and Mayor Carter Harrison of Chicago. Among the guests present from Washington were: Commodore and Mrs. M. T. Endicott, Capt. A. S. Crowninshield, Paymaster-General Edwin Stewart, Engineer-in-Chief George W. Melville, Surgeon-General W. K. Van Rypen and wife, Chief Constructor Philip Hichborn and wife, Captain and Mrs. Samuel C. Lemley, Judge Advocate-General and Secretary of Agriculture Wilson and daughter, and Assistant Secretary of War John D. Meiklejohn.

The Illinois is a sister ship of the Alabama, now building at the yard of the works of the Cramps, Philadelphia, and a sister ship also of the Wisconsin, which is to be launched next month by the Union Iron Works, San Francisco. The contract, which stipulated the price of the vessel without armor or armament at \$2,595,000, was signed Sept. 26, 1896, and the keel was laid about a month later. One year from the present date is allowed for the completion of the battleship. The Illinois, although but a 16-knot vessel, and consequently not up to latter day ideas of essential speed for first-class fighting ships, still embodies in its design, as does the Alabama and Wisconsin, several innovations of a more or less radical character, in which naval officers who have advocated their adoption have evidenced some confidence. This ship was fully described and illustrated in the special navy edition of the Marine Review, published August 11, 1898. She is 373 feet over all, 368 feet on load water line, 72 feet beam and 20 feet freeboard forward by 13 feet freeboard aft and 19 feet freeboard amidships. The main propelling engines are of the vertical inverted cylinder, direct acting, triple expansion type with cylinders 33½, 51 and 78 inches by 48 inches stroke. The collective indicated horse power is 10,000. There will be eight single-ended boilers of the horizontal return fire-tube type, 9 feet 11 inches long by 15 feet 6 inches diameter and with a working pressure of 180 pounds. The total heating surface of boilers is 21,200 square feet and the total grate surface 685 feet.

Finances of the Cramp Company.

Rumors of a dividend at an early date from the William Cramp & Sons Ship & Engine Building Co. are causing a discussion of affairs of the company in eastern financial journals. A report from one of the Boston stock concerns says: "The dividend to be paid in the near future, should the predictions be fulfilled, will probably not be less than 5 per cent. Dividends paid in former years were as follows: In 1891, 8 per cent; 1892, 8 per cent and 20 per cent scrip; 1893, 10 per cent; 1894, 18 per cent; and 1895, 7 per cent. This gives an average of 13 per cent per annum for five years, although the company had on its hands a floating debt of \$1,500,000. Even with the consideration of the amount which had to be expended last year in the settlement of the balance of the floating debt, and the 5 per cent. then remaining applicable to the stock, there was, it is claimed, earnings amounting to an additional 5 per cent. It must be remembered, too, that a 5 per cent dividend is equivalent to over 7 per cent

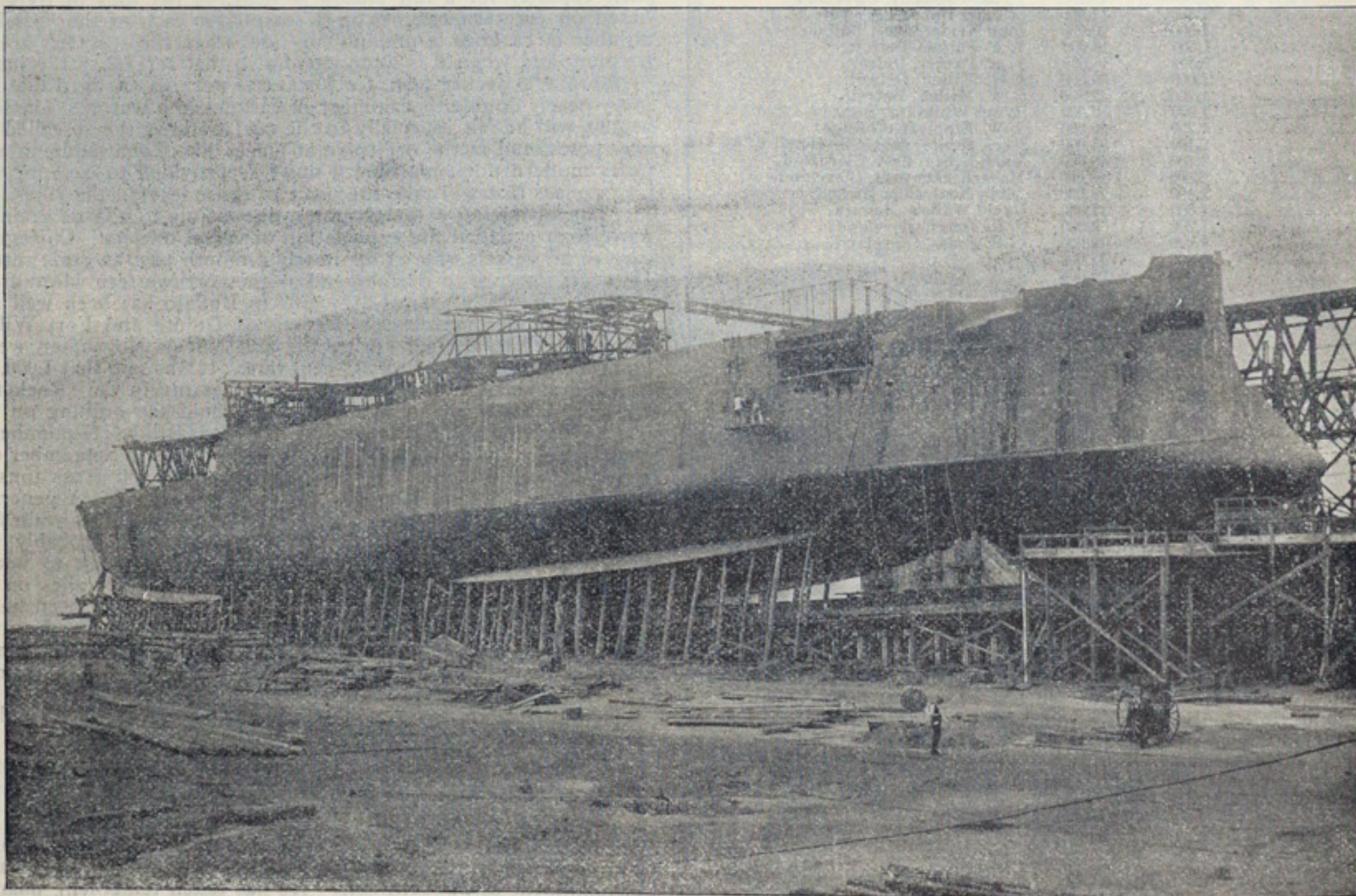


Photo by Rusk & Shaw.

BATTLESHIP ILLINOIS ON THE STOCKS, READY FOR LAUNCHING.

struction, their naval work having been confined to gunboats and similar craft.

The launch on Tuesday was a highly successful one from every standpoint, and was especially gratifying to President C. B. Orcutt and other officials of the company who were present. The vessel was christened by Miss Nannie Leiter, the eldest daughter of A. Z. Leiter of Chicago, in the

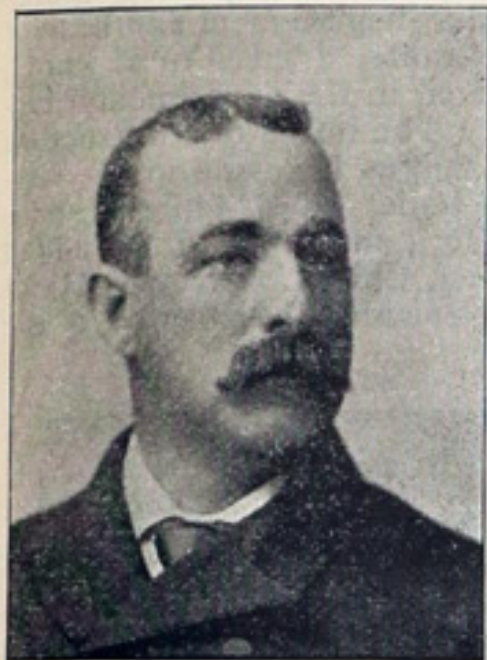
with stock at the present quotation of 71. The company now has on its books orders aggregating more than \$10,000,000, and the outlook for additional business is said to be extremely favorable."

The American Steel Barge Co., West Superior, Wis., will in the near future erect a 25-ton electric crane in its machine shop.

FIVE MASTED SCHOONER.

LARGEST VESSEL OF HER CLASS EVER CONSTRUCTED FOR OCEAN SERVICE,
NOW BUILDING FOR CAPT. J. G. CROWLEY BY H. M. BEAN OF CAMDEN, ME.

Vessel men who talk of the speedy decline, if not total disappearance, of wooden sailing vessels will perhaps find some difficulty in reconciling their theories with the announcement that such men as Henry W. Cramp of the large Philadelphia ship building firm are interested in adding to the sailing fleet one of the largest schooners ever constructed on the Atlantic coast, a vessel now building at Camden, Maine. It would seem that there is still a place in trade involving long voyages for the American wooden sailing ship.

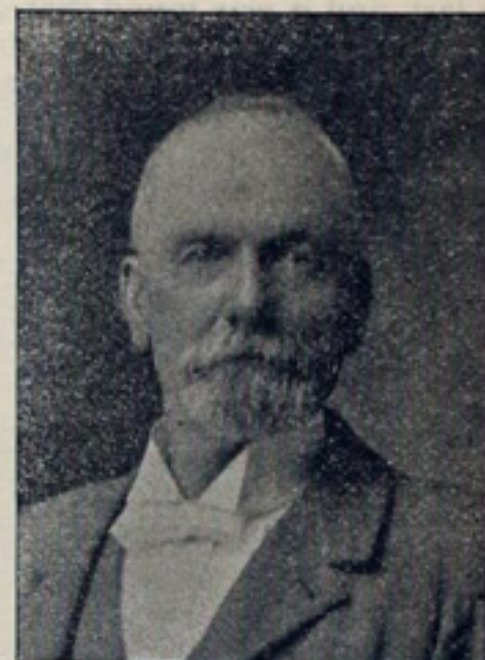


CAPT. J. G. CROWLEY.

The five-masted schooner now building at the yard of H. M. Bean at Camden for Capt. J. G. Crowley of Taunton, Mass., and which is shown in the accompanying illustration as she appears in frame, is the largest fore and aft schooner ever constructed for ocean service, and will carry 4,000 tons of coal on 23 feet draught and spread 10,000 yards of canvas, the cost of the vessel, when completed, being expected to exceed \$90,000. The new boat, for which a name has not yet been selected, will be launched on Wednesday, Dec. 14. This vessel will be 318 feet over all, 282 feet keel, 44 feet 4 inches beam and 21 feet 6 inches depth. There will be two whole decks and a 4-foot poop, running to one berth aft the forward hatch. The poop deck will extend full 20 feet forward of the main rigging. The keelson is 8 feet high and the sister keelsons 4½ feet in height. The frame is of Virginia oak and the planking inside and out of Georgia pine. The cabin will be finished in ash, mahogany, cypress and sycamore. The ceil-

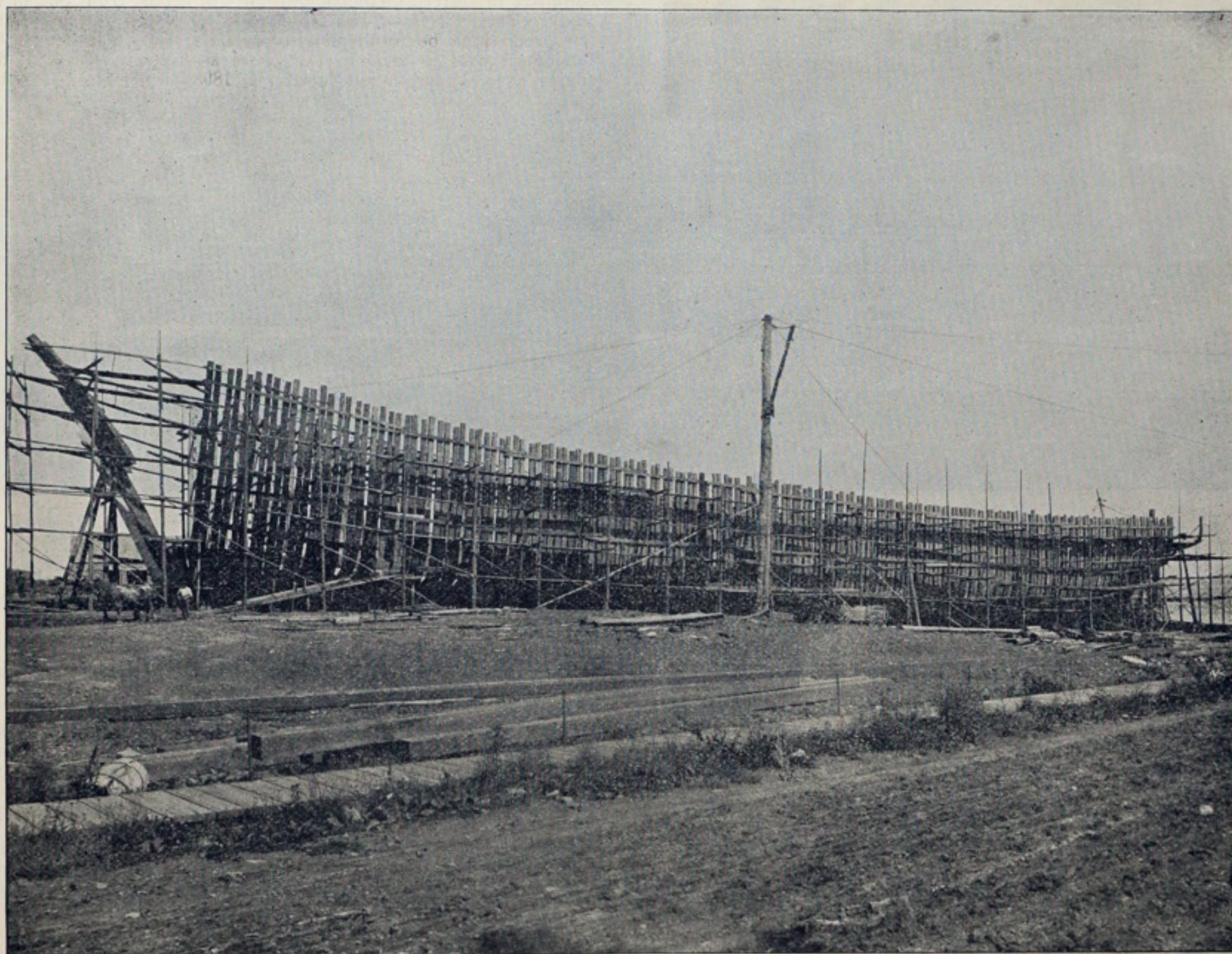
ing of the lower hold is constructed of 12 and 14-inch timbers up to the lower deck beams. The 'tween deck ceilings are of 8 and 12-inch timber; waterways are 14 inches square with two lock streaks 12 by 12 inches. The beams are 14 inches square and 3 feet apart. The white oak frame is 14 by 16 inches; the depth of the lower hold is 13½ feet and 'tween decks is 8 feet. The upper deck waterways are 12 by 12 inches and the lock streaks 10 by 12 inches. The vessel will have five Oregon pine masts, each 112 feet long, and the diameter of the foremost will be 29 inches, while the other four will each be 28 inches in diameter. The foretopmast is to be 56 feet long by 20 inches in diameter, and the other four topmasts are each to be 56 feet in length by 18 inches in diameter. The jibboom will be 75 feet long by 20 inches diameter. The bowsprit has 30 feet outboard, and is 30 inches square. The fore, main, mizzen and spanker booms are to be 48 feet long by 14 inches in diameter, while the jigger boom is to be 78 feet long and 17 inches in diameter. The vessel, which will be lighted throughout by electricity and heated by steam, will be fitted with all the latest improved machinery, including steam windlasses, steering and hoisting gear and two 6,000-pound anchors with 190 fathoms of 2¾-inch chain. John J. Wardwell is the designer of the vessel. The keel was laid on July 15, and work has been pushed with all possible speed since that time. The vessel will engage in the coal trade between Philadelphia and New England ports. Capt. J. G. Crowley, who is to be managing owner, manages, in connection with his brother Arthur, the schooners Mt. Hope, Sagamore and Henry W. Cramp, all sailing between the ports above mentioned, and has successfully demonstrated the ability of vessels of this class to make money when properly operated. Capt. Crowley has, in addition to the support of Mr. Cramp, the backing of such men as Samuel J. Goucher and S. P. Blackburn & Co. of Philadelphia.

Mr. H. M. Bean, the builder of this large schooner, is known as one of the most experienced and skillful builders of wooden vessels on the Atlantic coast. As soon as work is completed on the ship here described, he will begin the construction of a large four-masted schooner, 206 feet in length, for Capt. Clarence Birdsall of Tom's River, N. J.



H. M. BEAN.

The introduction by the Carnegie company of the Krupp process in the manufacture of armor plate is likely to have an important effect in battleship construction. The recent tests of thick plates made by the Krupp process having shown that they possess proportionately as high



FIVE-MASTED SCHOONER BUILDING FOR CAPT. J. G. CROWLEY BY H. M. BEAN, OF CAMDEN, ME.

qualities as thinner plates, the naval experts are naturally justified in reaffirming the opinion that the armor of a battleship will, if manufactured by the Krupp process, enable a considerable lightening of the vessel without any sacrifice of efficiency. For instance, the weight of the armor of the battleship Illinois, launched this week, is about 2,800 tons, and it is estimated that the use of plates made by the Krupp process would reduce this weight fully 10 per cent. The general opinion is that it would be impracticable to make any material reduction of thickness in plates below 6 inches, but the heavier plates could be scaled down fully 15 per cent. On this calculation at least 300 tons additional displacement could be devoted to coal capacity or machinery space.

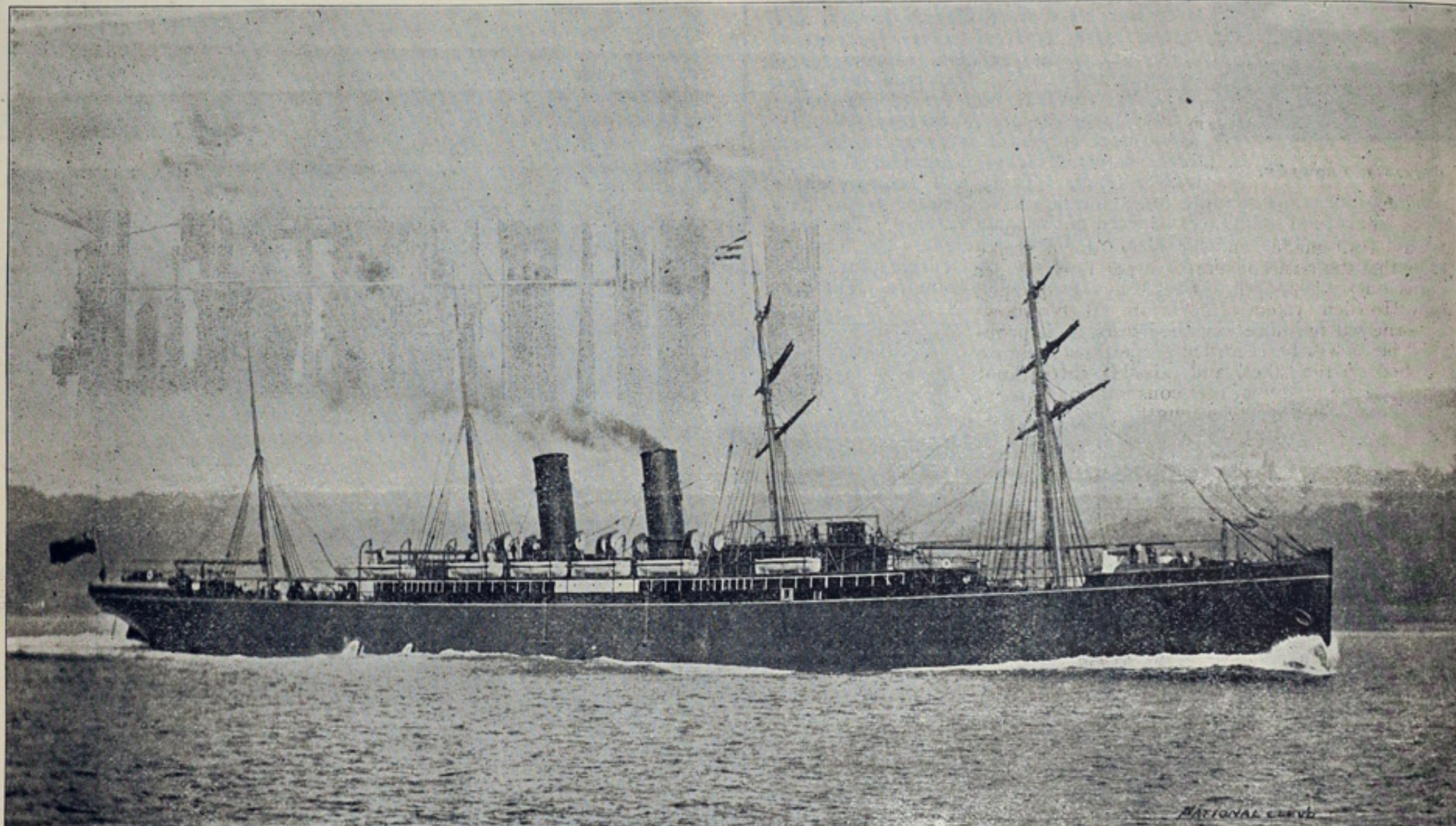
The Refloating of the China.

One of the most important salvage operations that has been accomplished in many years is found in the refloating of the mail steamer China, owned by the Peninsular & Oriental Navigation Co., after she had been on the rocks off the island of Perim in the Red sea nearly five months. The salvors and the owners of the vessel were heartily congratulated when it was announced last month that she had been successfully refloated and taken into harbor for survey and overhaul.

The China, of which a picture is herewith presented, is a vessel of 7,899 gross tons, and was built by Harland & Wolff of Belfast in 1896. She is 500 feet over all, 54 feet beam and 25 feet deep. She stranded on March 25 last, and it was found that she had been driven upon a rock which made an immense hole in her double bottom, and that her forehold was full of water. Assistance was sent as soon as news of the stranding reached the offices of the P. & O. Co. and salvage steamers engaged from Hamburg and Stockholm firms. Three of these salvage steamers arrived at the wreck about April 10, and the wreckers immediately set to work. An examination by the divers disclosed the fact that huge rocks had pierced the fore part of the ship, and it was found necessary to remove these by submarine blasting operations before any attempt could be made to fill up the holes. Continuous bad weather made these operations most difficult, and several

Controversy Over a Bath Bid.

There is likely to be more or less ill feeling over the rejection by the board of construction of the navy department of the bid of the Bath Iron Works for the construction of three torpedo boats, after these vessels had been assigned to the firm in the original apportionment. The Bath company, it seems, proposed to build a 29-knot boat of French design on plans and specifications purchased from Normand. The proposition did not meet with the approval of the experts and the company consented to a modification of the plans in a considerable degree, but refused to make all the concessions demanded and guarantee 28 knots speed. They explained that the risk of any such guarantee was too great, in view of the abandonment of so many important features of their design. They were, moreover, willing, with the increased weights, greater displacement and heavier draught created by the board's change, to guarantee a speed of 27 knots, which is one knot more than the speed indicated in the departmental circular that was the basis of the Bath proposal. The board of construction has, it is claimed, demanded that material changes be made in the machinery, notably by an increase in the size of boiler tubes, while the ordnance officers demand that torpedo compressors and an outfit be added to the boat. As stated in the Review last week, Chief Constructor Hichborn has made a minority report in which he sustains the position of the



P. & O. LINER CHINA RELEASED AFTER FIVE MONTHS ON THE ROCKS AT PERIM.

months of steady work were required before the divers finally began the task of tightening the steamer's bottom. About the opening of September the pumps of the salvage steamers were called into requisition, and with their aggregate capacity of 14,000 tons of water per hour, this part of the work was not found to be very difficult. The court of inquiry held on the stranding of the China found that the steamer was stranded by reason of the captain setting a wrong course, and it is believed that a pretty severe punishment will be imposed. Censure was also passed upon the supernumary second officer in charge of the bridge while the captain was at dinner, for not having forced to the captain's attention his own opinion that the vessel was running into danger. It was shown by the testimony submitted that the captain—one of the most experienced navigators in the service, by the way—was on the bridge three-quarters of an hour before the ship struck, and had plenty of time to verify his position by the lead, or otherwise, if he had entertained any doubt on the subject.

Capt. James Stone, United States supervising inspector of steam vessels in the district covering Lakes Erie and Ontario, says in a letter to the Great Lakes Register of Chicago: "I am glad to acknowledge the receipt of the Masters' Manual, for which please accept thanks. From an inspection of the work, I consider it a pamphlet containing valuable information in condensed form. The instructions relating to the compass deviation and variation are especially matters of great importance and cannot be too well understood and observed. This branch of lake navigating has not heretofore received the attention that prudence and safety would dictate. The frequency or infrequency of marine disasters must determine the rates of insurance, which have a direct bearing upon cost of transportation, and therefore upon our ability to compete with foreign nations in the markets of the world. The degree of prosperity to which we shall attain depends wholly upon the measure of skill, intelligence and economy with which we produce and transport our commodities. The manual is certainly conducive to these ends." This book will be sent free of charge to any captain or mate making application to the Great Lakes Register, Royal Insurance building, Chicago.

Bath Iron Works, maintaining that the company is liberal in the matter and that in his opinion further concessions to departmental demands would mean to them a loss of money.

Higher premiums on marine insurance will certainly be demanded before another season's business is taken up on the lakes. The American Institute of Marine Underwriters, organized recently in New York, met a few days ago to receive Mr. Frederick A. White, manager of the Marine Insurance Co. of London, who visits this country as the representative of British and continental marine underwriters to endeavor to revive the movement here to increase marine insurance rates in co-operation with the companies on the other side of the water. All the leading companies were represented, and the subject of higher premiums, which has been very thoroughly discussed on the other side, will be more fully taken up here as a result of Mr. White's visit. It is a fact that the big companies in this country, with one or two exceptions, have quit the lake hull business, and now the foreign companies are seeking co-operation with a view to a general advance in rates.

Recent reports credited the steamer Superior City with having broken the record for grain cargoes, and the schooner John Fritz with making a new ore cargo record. Both are incorrect. The Superior City, according to a letter to the Review from Mr. A. B. Wolvin of Duluth, her owner, carried on her last trip 200,000 bushels of wheat and 41,800 bushels of flax, equal to 7,175 net tons. On a previous trip she carried 266,550 bushels of corn, equal to 7,463 net tons. The stage of water is getting lower, as is usual at this time of year, and it is not probable that there will be any breaking of cargo records for the balance of the fall.

At a recent meeting of the executive committee of the Lake Carriers' Association, wages were advanced. Firemen, wheelmen and lookouts on steamers are advanced \$5 to \$7.50 a month and deck hands \$5. A slight advance was also made in the wages of assistant cooks.

A HORSE POWER ON 1½ POUNDS OF COAL.

PERFORMANCE OF THE PACKAGE FREIGHT STEAMER TROY, ON HER FIRST TRIP DOWN THE LAKES.

Officials of the Detroit Dry Dock Co. are greatly pleased with reports of the performance of the steamer Troy on her maiden trip. The Troy is the largest package freight steamer on the lakes and is also one of the finest ships of her kind on fresh water. She is owned by the Western Transit Co. (lake line of New York Central Railroad) and was designed to engage exclusively in the grain and package freight trade. In contracting for this vessel the Detroit Dry Dock Co. was not required to figure against other firms on the close basis that usually attends the placing of contracts for freight carriers. They had built a large number of steamers for the Western line. All were satisfactory, and when another good vessel was desired a close figure was not demanded. The price of the vessel was, of course, given careful consideration by the Western line management, but the job was not one of figuring down to the last dollar. This is why officials of the Detroit company are so well pleased with first reports from the Troy. They agreed to build a vessel that would make 13 miles an hour loaded on 2,650 pounds of fuel. The Troy on her first trip down Lake Superior with a load of iron ore made 13.2 miles an hour on 2,541 pounds of fuel. Ore was taken on the first trip in order to make the test. The ship was guaranteed to carry 5,050 tons on 17 feet 6 inches; her load was 5,076 tons on 17 feet 4 inches. She developed 1,690 I. H. P., and the chief engineer of the line, Mr. Wilson, who furnishes the foregoing data, also figures from a test made on the way down Lake Superior that the coal consumption per I. H. P. per hour was only 1.5 pounds. The Troy is equipped with the Howden system of hot draft. If this showing is borne out by more extended tests, as it probably will be, it will be recorded as the lowest figure yet reached on the lakes, and possibly throughout the world, in the matter of fuel consumption.

The Troy is 402½ feet in length, 42½ feet beam and 28 feet molded depth. There are seven gangways, all above the 16-foot water mark, and the hatches are 24 feet centers. There are two complete electric lighting plants, and the hoisting apparatus for freight, as well as all other parts of the ship's equipment, is modern in all respects. The propelling engines, supplied with steam at 210 pounds pressure, are quadruple expansion with cylinders of 19, 27½, 40 and 58 inches diameter with 42-inch stroke.

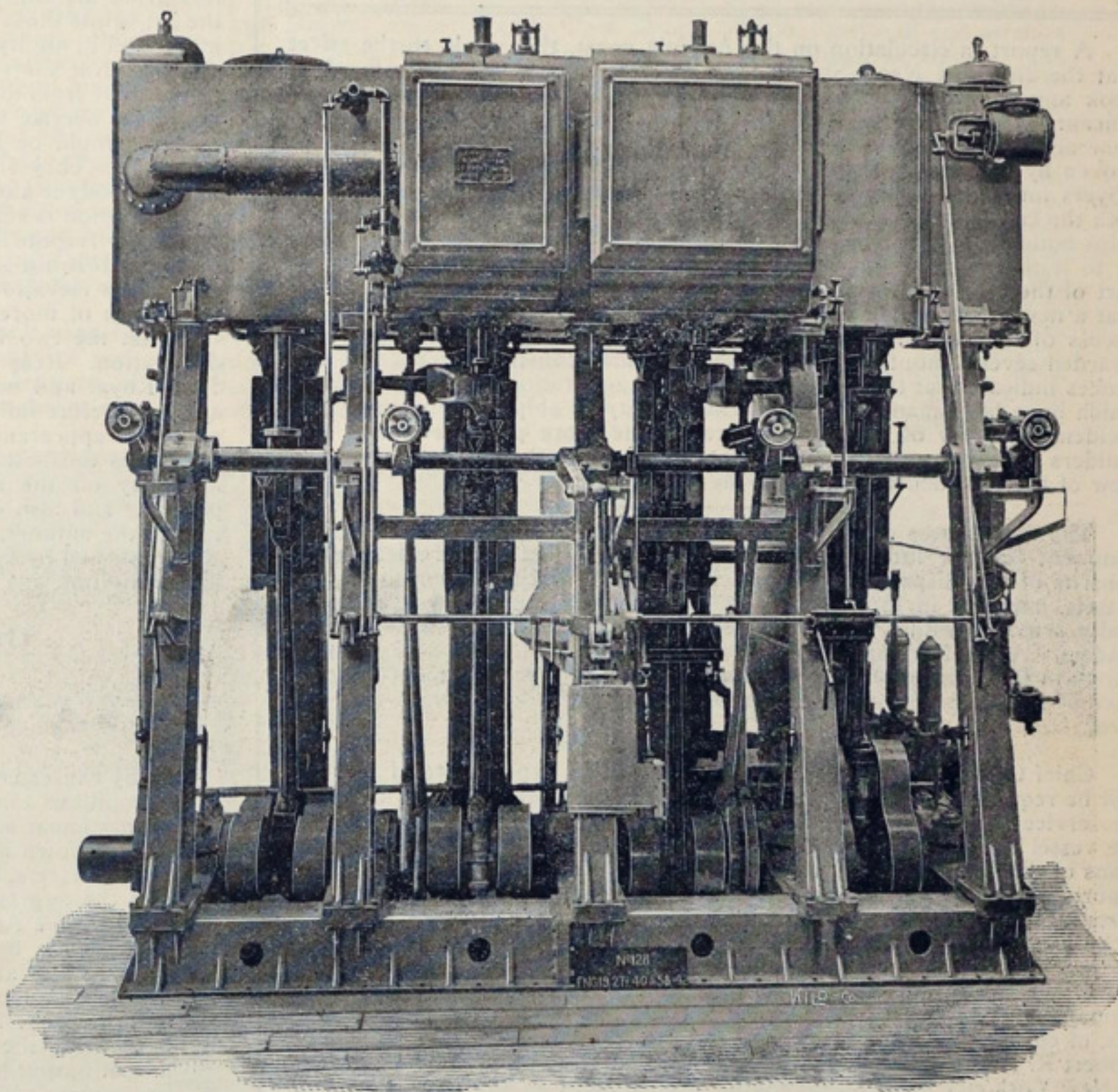
The car dumping machines at Lake Erie ports have certainly been loading coal into ships at a wonderful rate during the present season. At the Erie fast plant in Cleveland, a few days ago, 2,700 tons of cargo and 140 tons of fuel were loaded into the steamer Geo. W. Roby in eight hours. This kind of dispatch is an every-day affair at some of the best docks.

October Storms on the Lakes.

October has always had the reputation among lake vessel men of being a month characterized by considerable tempestuous weather. This fact lends considerable interest to the storm forecast contained in the

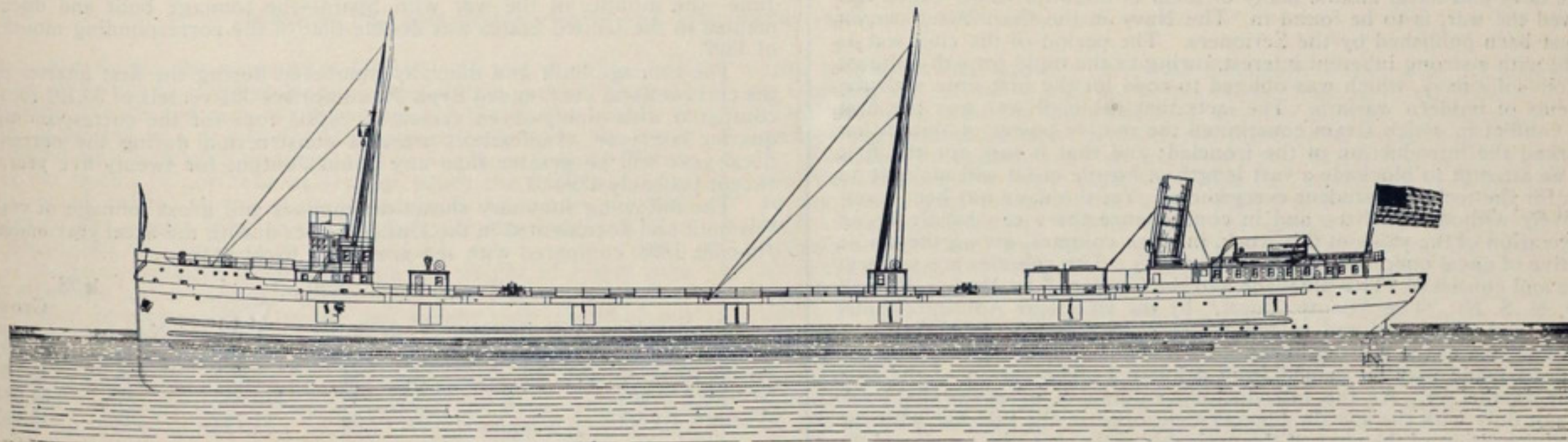
number that move northeasterly from the central valleys. however, is greater than during the preceding month and the storms are more apt to be accompanied by high winds and gales. On the average five storms pass directly over the lake region in October, the majority of which, however, can be safely weathered by the larger craft. Occasionally an October storm of unusual severity sweeps over the lakes endangering the safety of the strongest vessels. In the last twenty years half a dozen such storms have occurred, all of which left a trail of destruction in their wake.

"One of the most severe storms in the annals of lake shipping occurred



QUADRUPLE EXPANSION ENGINES OF NEW WESTERN LINER TROY.

Oct. 16-17, 1880. The coming of this storm with the attendant changes in the elements—the passage in a few hours from the delightful weather of autumn to a howling gale with snow squalls and freezing temperature—illustrates one phase of lake weather that happily we are not often called upon to chronicle. The dangerous storms of the great lakes almost invariably come from some westerly direction. The violent winds are confined to the central portion of the storm, which is generally as large as



monthly chart just issued by the weather bureau. The forecast is as follows: "There is an increase both in the number and violence of lake storms in October, as compared with September. The squall winds and thunderstorms of the warm season have now given way to a different class of storms, viz., those of the winter. These are more regular in their occurrence and movement, sweep over larger areas, and develop greater strength than those of summer. They are generally preceded in the Lake region by higher temperature, increasing cloudiness, and moderately high winds from some easterly or southerly quarter which blow steadily as compared with the short-lived squall winds of summer. The greater number of October storms pass over the northern or Superior route. The

the lake itself, hence there is nothing to be gained by altering the course of the ship as might be advisable on the high seas. As has been stated, previously the hardest blow almost invariably occurs with the shift of the wind to the southwest or northwest, as the storm center passes the vessel. Whether the wind shifts from southeast to southwest, or backs from northeast to northwest, depends upon the position of the vessel with regard to the storm center. The great majority of the high winds come from a westerly quarter, west or southwest on the lower lakes, and from southwest to northwest on the upper lakes. High winds from an easterly quarter rarely prevail except at Duluth. In the latter case the direction of the wind is doubtless influenced by local topography."

MARINE REVIEW

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A report in circulation on the Atlantic coast, this week, to the effect that the Newport News Ship Building & Dry Dock Co. has refused to book any additional orders for merchant vessels is, if true, highly significant. That the rumor, if not literally correct, is at least indicative of the general conditions existing at the Newport News yard would seem to be proven by the failure of the firm to bid upon the torpedo boats and destroyers for which contracts were recently awarded, taken in conjunction with the fact that in addition to the five merchant vessels and three battleships building by the Newport News company, there has just been awarded to it the contract for one of the coast defense monitors. In another part of the Review a prominent eastern vessel owner is quoted as saying that a new vessel which he will build will entail an outlay 20 per cent. in excess of that which would have been necessary had the contract been awarded several months ago. These and other constantly recurring evidences indicate that there was nothing of exaggeration in the predictions which have been made of a wonderful activity in ship building, and it is incidentally worthy of note that several of the more prominent lake ship builders anticipate securing some contracts from the Atlantic coast, in view of the crowded condition of the yards there.

The meagerness of the Mexican naval force is not a matter of great comment because little known. As a matter of fact the Mexican navy consists of two dispatch boats, launched in 1875, and two unarmored gun vessels, launched in 1874, each of 425 tons and 425 horse power, and severally armored with a 4-ton muzzle-loading gun and four small breech-loaders. A steel training ship, the Zaragoza, 1,200 tons, was built at Havre in 1891, four gunboats are building and five first-class torpedo boats have been ordered. The fleet is manned by about ninety officers and 500 men.

Chief Constructor Hichborn estimates that an expenditure of \$800,000 will be required to put the Spanish cruiser Infanta Maria Teresa in shape for service again. When it was reported that there was a likelihood that the vessel could be floated, Mr. Hichborn sent to England for a set of plans of the vessel, and, after a comparison of these plans with the official reports detailing her injuries, ordered the immediate construction of the parts that will require replacing. The machinery of the cruiser is reported to be in good condition.

Opposition to the abolition of tolls on the Welland canal is beginning to manifest itself in aggressive form. The Buffalo Merchants' Exchange has, of course, taken the matter up, and in accordance with the request of Robert R. Hefford, president of that organization, the Maritime Exchange of New York city has sent out a letter urging that the opposition be maintained and promising the support of the transportation interests of New York.

The British warships Renown, Talbot and Indefatigable and the United States cruiser Marblehead are at Quebec to participate in the Champlain celebration. The Renown is a first-class battleship and the other two British vessels are cruisers of the North Atlantic squadron.

The Navy in the Civil War.

Compensation in a considerable degree for the avalanche of volumes on the navy and naval affairs, many of them of doubtful value, which has followed the war, is to be found in "The Navy in the Civil War," which has just been published by the Scribners. The period of the civil war is fraught with a strong inherent interest, owing to the rapid growth—almost creation—of a navy, which was obliged to cope for the first time with the problems of modern warfare. The facts that the civil war was the first great conflict in which steam constituted the motive power of ships; that it marked the introduction of the ironclad; and that it saw, for the first time, an attempt to blockade a vast length of hostile coast will make it an epoch for the technical student everywhere. Yet the navy has been comparatively without annalists, and in consequence there can hardly be an exaggeration of the value of this work, in three volumes, giving the whole narrative of naval operations from 1861 to 1865. The volumes are uniform in size and consist of "The Blockade and the Cruisers," by Prof. J. Russell Soley, U. S. N.; "The Atlantic Coast," by the late Rear Admiral Daniel Ammen, and "The Gulf and Inland Waters," by Capt. A. T. Mahan.

A fair idea of the thoroughness of the resume and the value of the observations made may be gained from a hurried examination of the first volume in the set. As the introductory volume of a series, the book deals not only with the specific objects mentioned in the title but with the general condition of the navy at the outbreak of the war, the peculiar difficulties before it and the way in which these difficulties were met. At the very outset the author says: "The naval war of 1861 was marked by two principal features. The first is that while one side had a small force of naval vessels which were generally good of their kind, the other entered the contest with absolutely nothing that could be called a man-of-war. The second is that though certain developments in the character and construction of ships and of weapons had been foreshadowed, and had been partially realized, it was while the struggling was actually in progress that changes took place in those respects which amounted to a revolution in naval warfare. At the beginning the fact that sailing vessels were soon to be laid aside was still far from general recognition, especially among officers of conservative tendencies; the three great weapons of today, the rifled gun, the ram and the torpedo were almost unknown in the service; the iron armor was still an experiment. The modifications of the past

fifteen years had accustomed men's minds to the idea that changes would gradually take place; but none foresaw or were prepared for the tremendous development that was wrought in four years of actual fighting."

Prof. Soley's forceful way of incidentally dealing with questions which are vital problems today is exemplified by the following: "The efficiency of the service was further weakened by the vicious system of promotion by seniority, to which the navy has always clung tenaciously in the face of reason and precedent, of the analogies of civil preferment, and the example of other military and naval establishments. The effects of the system may be briefly indicated. Every man who lives long enough, unless gross incompetency can be proved against him, goes to the head of the list, while those who have entered the service later, however much they may excel in ability or zeal, remain below to wait their turn. It is purely a question of survival. An officer comes to look upon promotion as his right, apart from any considerations of merit or distinction. Public opinion in the service has no leaders, for the leading minds are not destined, as they would be in every other profession, to gravitate to the leading positions. They simply take their turn. The natural conservatism of a military body is exaggerated, and judgment becomes warped by tradition. As promotion is sure there is no inducement to effort. No one will readily assume responsibility, for he only runs a risk without any prospect of reward. It is not so much the presence of poor material that injures a service, as its elevation by an iron rule of promotion, and the enforced subordination of more capable men."

That the two volumes of the set are equally valuable does not need declaration. Rear Admiral Ammen commanded a vessel in the battle of Port Royal and was present at the two bombardments of Fort Fisher, and is therefore fully competent to discuss every phase of these campaigns, while the appearance of the name of Capt. Mahan on the title page of a volume is the best possible assurance of its right to consideration as an authority on the subject discussed. The volumes are illustrated with portraits and also contain maps and diagrams prepared under the direction of the authors.

Published by Charles Scribner's Sons, Fifth avenue New York; price, \$1 per volume.

THE YEAR IN SHIP BUILDING.

NUMBER AND TONNAGE OF NEW VESSELS TURNED OUT IN VARIOUS SECTIONS OF THE UNITED STATES DURING THE TWELVE MONTHS ENDED JUNE 30, 1898.

Many causes contributed to make the fiscal year ending June 30, 1898, an unpropitious one for the ship building interests of the United States, and no particular significance attaches, therefore, to the fact that while an increase is shown in the business of the yards on the Pacific coast and on our western rivers, there has been a falling off in both the number of vessels and the aggregate tonnage turned out by the builders on the great lakes and on the Atlantic coast as compared with the showing of the year previous. The figures hereafter given may be accepted as absolutely authentic, as they are obtained from advance sheets of the annual report of Mr. E. T. Chamberlain, United States commissioner of navigation. It will be noted that Mr. Chamberlain is of the opinion that output of new tonnage during the current fiscal year will very probably be greater than any annual output for twenty-five years past.

The returns to the navigation bureau show that during the fiscal year ended June 30, 1898, there were built and documented in the United States 952 merchant vessels of 180,458 gross tons, compared with 891 vessels of 232,233 gross tons for the preceding fiscal year. The decrease in construction on the great lakes was considerable, the new documented tonnage amounting to only 54,084 tons, compared with 116,937 tons for the previous fiscal year. The construction on the Pacific coast was 49,789, compared with 7,495 tons for the previous fiscal year, this increase being chiefly steam vessels designed for the Alaskan-Pacific and Alaskan river trade. The decrease in construction was wholly in the first half of the fiscal year, when ship building in Great Britain and other maritime nations also showed a falling off of about 20 per cent. During April, May and June—the months of the war with Spain—the tonnage built and documented in the United States was double that of the corresponding months of 1897.

The tonnage built and officially numbered during the first quarter of the current fiscal year, ended Sept. 30, comprises 301 vessels of 83,191 tons, compared with ninety-seven vessels of 26,805 tons for the corresponding quarter last year. Indications are that construction during the current fiscal year will be greater than any annual output for twenty-five years, except probably 1890-91.

The following summary shows the number and gross tonnage of vessels built and documented in the United States during the fiscal year ended June 30, 1898, compared with the preceding fiscal year:

	1897.		1898.	
Geographical distribution.	Number.	Gross tons.	Number.	Gross tons.
Atlantic and Gulf coast.....	609	96,009	514	63,090
Pacific coast	64	7,495	228	49,789
Northern lakes	120	116,937	87	54,084
Western rivers	98	11,792	123	13,495
Total	891	232,233	952	180,458
Power and material.				
Sail:				
Wood	327	29,678	357	27,692
Steel	11	34,631	2	6,724
Steam:				
Wood	244	27,917	343	57,337
Iron and steel	44	78,236	51	48,501
Canal boats	70	10,216	20	2,386
Barges:				
Wood	182	40,027	169	30,777
Steel	13	11,528	10	7,041
Total	891	232,233	952	180,458

BALANCE DRY DOCK.

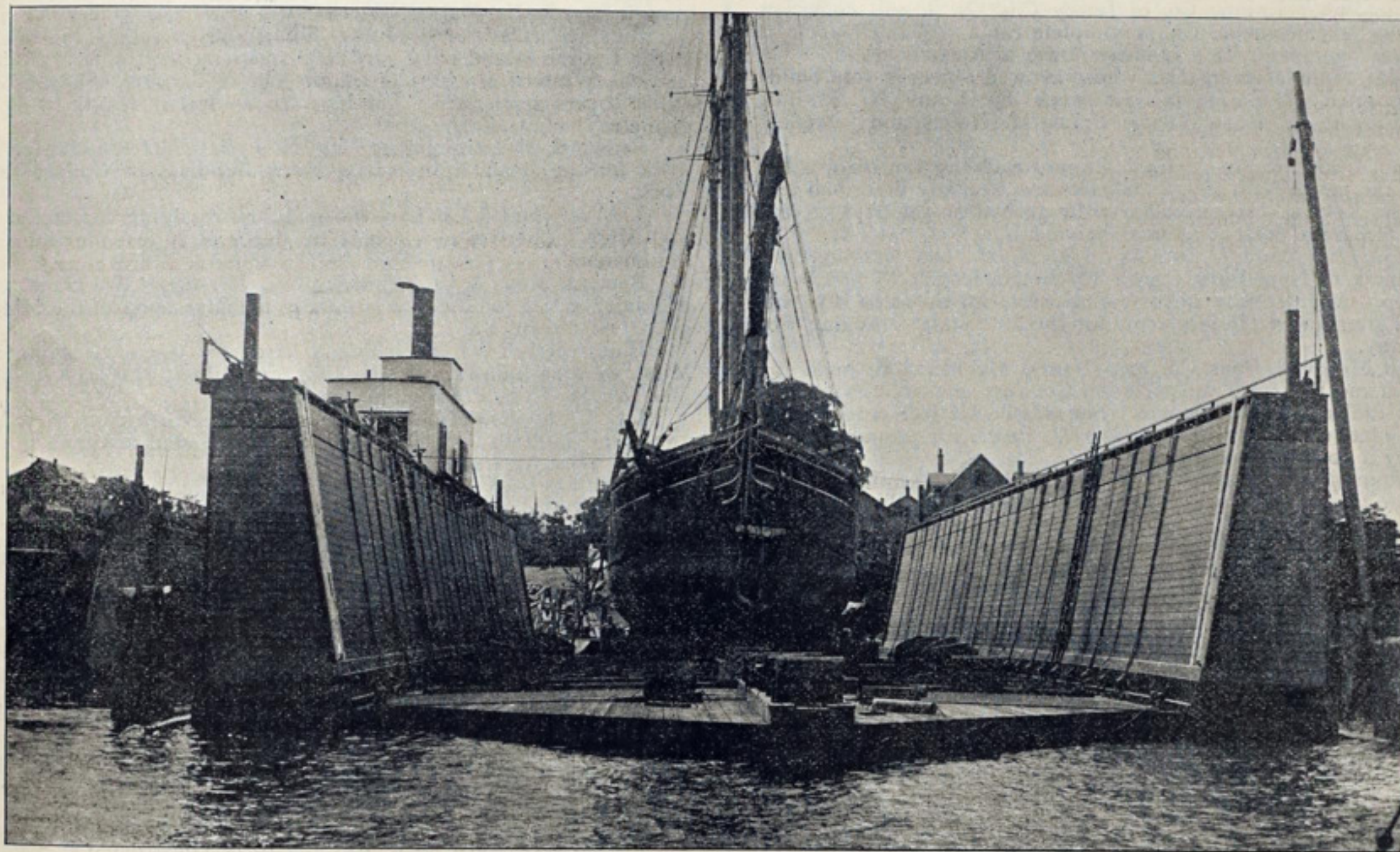
ONE OF THE BEST STRUCTURES OF THE KIND IN THE COUNTRY PURCHASED BY THE UNITED STATES GOVERNMENT FROM THE PERTH AMBOY DRY DOCK CO.

Few purchases made by the United States government during the recent war are likely to prove of such lasting benefit to the navy department as the acquisition of the large new balance dry dock, built only a short time ago by the Perth Amboy Dry Dock Co. of Perth Amboy, N. J. With a fleet of the size which will necessarily have to be stationed in West Indian waters from this time forward, the dock will unquestionably be in use almost continually. This dock has a length of hull of 175 feet, while the length over outriggers, which have been put on in such a manner as to possess the same strength as the hull, is 235 feet, which is the actual length of keel that can be blocked on keel blocks, thus making the capacity of the dock sufficient to accommodate a vessel 250 feet long and 18 feet 6 inches draught. The width of the dock inside of wings is 61 feet, outside of wings 78 feet, and depth 10 feet. The estimated lifting capacity is 2,300 tons. The structure is divided into twelve compartments, each fitted with two pumps 14 inches square, and any one of them may be pumped independent of the others by an ingenious arrangement of leaders and shut-off gates, and moreover, this is done from the one wing upon which the machinery boiler and engine are located.

The engine is of 125 horse power and pumps up the dock with an average load in twenty-five minutes. Other equipment consists of four windlasses, a steam capstan and a steam pump for washing bottoms of vessels; also sliding bilge chocks and patent adjustable keel blocks, which

Co., no vessel in the service made a better showing from an engineering point of view.

The Annapolis began her war service by convoying the Fern with ammunition from Tampa to Key West. She was three weeks on the blockade in front of Havanna, where she took part in the engagement with the cruiser Conde Venedito and two gunboats that attempted to run the blockade, but owing to the prompt action of the blockading fleet did not venture beyond the range of Morro's guns. The Annapolis was instrumental in the capture of the French steamer Lafayette and barque Santiago Apostol, the former being released upon arrival at Key West on application of the French Ambassador. From service on the blockade, Capt. Hunker was ordered to Port Tampa, to take charge of and arrange for convoying the army of General Shafter to Santiago de Cuba. The fleet thus formed sailed from Tampa on June 14 and consisted of thirty-eight steamers loaded with troops and five gunboats. The sight presented as they steamed out of Tampa bay was truly magnificent. Upon arrival at Santiago, six days later, the Annapolis was detailed to take part in the bombardment of Siboney, the object being to distract the attention of the Spanish while United States troops were disembarking at Daiquiri. Siboney is 4 miles west of Daiquiri, and it transpired afterwards that a detachment of troops dispersed by the fire of the gunboats in front of Siboney was a portion of General Linares' army on its way to contest the landing of General Shafter. After several days in front of Siboney and Daiquiri, the Annapolis was ordered to Guantanamo bay, and for three weeks guarded the upper part of the bay against attack of several Spanish gunboats stationed at Caimanera. Guantanamo bay was used as a naval base, and there were at that time several colliers, supply vessels, repair ship and torpedo boats, besides cruisers and battleships, coming constantly for



FLOATING DRY DOCK PURCHASED BY THE GOVERNMENT FROM THE PERTH AMBOY DRY DOCK CO.

can be manipulated from the wings after dock is sunk and vessel in position, making it possible to safely block any shape of hull, even if "hogged" to an unknown extent, and also admits of shifting the blocks readily in such a case as putting in a new keel. The body of dock below the water line is sheathed with inch pine creosoted, this having been found effective in keeping out worms in northern waters, for which the dock was originally constructed, but the bureau of yards and docks has contracted with the builders to put copper over this, a necessity in the waters of Key West, to which port they propose to tow the dock.

The inside is so arranged as to distribute the weight of a ship over the whole structure, and is said by experts to be very well planed, and of much more than enough strength to life any weight that can be placed on it. This opinion seems to be endorsed by the navy officials, as this was the only dry dock purchased by the government after a careful inspection of everything in that line in the Atlantic and Gulf ship yards. Mr. Joseph D. Rankin, the company's superintendent, planned the dock, which is an improvement on several others built by him. Other officers of the company are W. Parker Runyon, president, and C. D. Snedeker, treasurer.

A REMARKABLE GUNBOAT.

THE ANNAPOLIS OF THE UNITED STATES NAVY HAS PROVEN HERSELF SO BY HER SERVICE IN THE WAR.—MACHINERY IN PERFECT CONDITION.

The most interesting features of the work of the vessels of the United States navy in the recent war, from the standpoint of the men interested in the technical side of naval operations, are only just coming to light as the officers arrive home from the fleets. The public heard little during the war of the performances of the gunboat Annapolis, yet according to information contained in a personal letter from Chief Engineer Salisbury of that ship to Vice President W. D. Hoxie of the Babcock & Wilcox Boiler

coal, provisions and repairs. Later the Annapolis was sent to Baracoa to intercept a vessel laden with provisions for the Spanish forces stationed there, and while near the town was fired upon by the fort. A short and spirited engagement followed in which the shore battery was silenced.

Returning to Guantanamo bay the ship was ordered to proceed with the Wasp and Leyden to the capture of Nipe bay, which was successfully accomplished, after running over mines placed in the channel, driving back troops stationed on heights above the entrance, and sinking the Spanish cruiser Don Jorge Juan and one gunboat. This exploit was similar to the capture of Manila bay, it being necessary to pass over torpedoes that, happily proved to be inoperative, though not known to be so at the time. From Nipe the Annapolis went to Puerto Rico and was the first vessel to enter the Port of Ponce that had been selected by General Miles as landing place for his army. She was then dispatched on a cruise about the island in search of transports from the United States that had been ordered to assemble at other points, and to send them to Ponce. While on this mission she took part in the capture of Cape San Juan.

During the war the vessel steamed 8,577 miles, and her engines made more than six million revolutions. The machinery is in splendid condition, and there has never been a moment's delay on its account. The boilers, of the Babcock & Wilcox type, have proved to be admirably adapted to war service, where it is necessary to change speed and steam pressure often and quickly. Not a leak was developed, and all machinery was kept at the highest point of efficiency by the men of the engineer force, though called upon continually for watch and regular duties. The engines of the Annapolis are of 1,460 indicated horse power, with cylinders 15¼, 23½ and 36 inches by 30 inches stroke. The two Babcock & Wilcox boilers have 3,600 square feet of heating surface and 94 square feet of grate surface.

The Marinette Iron Works, Marinette, Wis., has an order from the Minnesota Iron Co. for a 4-foot drum.

NEW CONTRACTS EVERYWHERE.

COUNTLESS OPPORTUNITIES FOR NEW BUSINESS IN THE SHIP YARDS, DREDGING OPERATIONS, HARBOR IMPROVEMENT WORK AND MACHINERY SUPPLIES.

F. H. Chappel of New London, Conn., has purchased the ship yard at Mystic, R. I.

The boat building plant of George W. Kneass at 718 Third street, San Francisco, Cal., was destroyed by fire a few days ago.

It is announced that the Grand Trunk Railway Co. of Canada will make Portland, Me., the terminus of a new steamship line.

The Macon Navigation Co. of Macon, Ga., has decided to build a steamer for river service but no particulars are as yet obtainable.

The Patchogue Steamboat Co. of Patchogue, N. Y., anticipates the construction of a new steamer to run between Bayport, Patchogue, Sayville and Point O'Woods.

Extensive improvements are being made at the ship yard of the Basin & Construction Co. at Greenport, N. Y. Among the new structures under way is a storage building 22 by 70 feet in size.

The Crescent Packet Co. has been organized by Norman Eustis, John A. Clark and others at Mississippi City, Miss., to operate a line of steamers on the lower river. The capital stock is \$50,000.

The newly organized United States and Australasia Steamship Co. has established offices at 60 New street, New York. The first steamer will leave for Australia and New Zealand about Oct. 15.

There is a rumor in eastern ship building circles to the effect that Leonard J. Busby of New York may have a fast steam yacht constructed to run between the metropolis and his country home at Glen Cove, L. I.

The Marine Vapor Engine Co. of Jersey City, N. J. will construct for H. D. Stevens of Savannah, Ga., a complete cabin cruising launch 35 feet in length and equipped with a 12 horse power also vapor motor.

The Elkridge Manufacturing Co., whose avowed object is ship building, was incorporated at Baltimore last week by Louis N. Rollins, Charmon M. Parrott, W. Ross Wilson, Frank M. Houck and James A. Wolsin.

The William Cramp & Sons Ship & Engine Building Co. launched a few days ago, the new Ward line steamer Havana, recently described and illustrated in the Review. Work will now be pushed on the Mexico, the sister boat for the New York and Cuban service.

Peter Colon, ship builder, Communipaw, N. Y., has building for Brown & Fleming of New York a scow 120 feet in length, 37 feet beam and 12 feet deep. Another scow of same dimensions for the same firm will be constructed later and a 116-foot scow for the Interstate Dredging Co. is also under way.

The Enoch Moore & Sons Co. has secured a contract to build for the Philadelphia and Smyrna Transportation Co. a wooden freight steamer to ply between Philadelphia and Smyrna. She will be 115 feet in length, 24 feet beam and 6 feet deep and will cost \$30,000. Power for propulsion will be furnished by a compound engine.

The Old Dominion Steamship Co. of New York and Norfolk, Va., has decided to name the steamers now building to its order the Hamilton and the Jefferson. The company has chartered the steamer J. S. Warden of New York to replace the Northampton, recently burned.

Archibald H. Bull of the New York & Porto Rico Steamship Co. is quoted as follows in a New York paper "We have a contract to let for a new ship for our line, and I find that we cannot get it built for 20 per cent more than it would have cost if the contract had been placed a few months ago."

The steamer City of Idaho, building at Edwardsville, Ark., for John Brenner of Memphis, Tenn., and Capt. George Phillips of Edwardsville was launched last week. Waterbury & Caruthers are the builders. The vessel is 88 feet in length by 22 feet beam. She will be equipped with an 8-inch cylinder engine with 4 foot stroke, and a boiler 46 inches in diameter by 17 feet 7 inches long.

The Oakland Improvement Club is anxious to secure the establishment of a ship building plant at Oakland, Cal. A committee has been appointed to ascertain what inducement the Oakland Iron Works would require to engage in ship building and also to open negotiations with the Risdon Iron Works of San Francisco looking to the removal of its plant to Oakland. Communications may be addressed to R. J. Callahan, secretary.

The three-masted barge Grant, building for the Staples Coal Co. of Taunton, Mass., was launched last week at the yard of Kelley, Spear & Co., Bath, Me. She is 182 feet in length, 35 feet beam and 16 feet depth. The launch of the Dunlo, a sister barge, has been set for this week. Both vessels will be equipped with Hyde windlasses and hoisting engines. After the launching of the Dunlo, Kelley, Spear & Co. will begin work on two spruce barges for the same company.

Two important contracts have just been closed by Supt. Saml. Coffin of the Cincinnati Marine Ways, Cincinnati, O. One of these is for a new \$20,000 steamer for the Burnside and Cumberland River Packet Co. of Burnside Ky., which also owns the steamer Burnside. The new vessel will be 130 feet long by 24 feet beam and will be fitted with a Scotch Boiler. An excellent complete lighting plant will be a feature of the vessel. The other contract, which will amount to about \$5,000, is for the construction of a new hull for the steamer Falls City, owned by the Kentucky River Towboat & Packet Co.

Work is all but completed on the steel steamer Kate Adams, building at Jeffersonville, Ind., for the Memphis and Arkansas City Packet Co. of Memphis. The vessel, which will cost when completed, in the neighborhood of \$100,000, is 240 feet in length, 40 feet beam and 7 feet deep. She will be equipped with compound engines with cylinders 24 inches in diameter by 8 feet stroke, and four boilers, 48 inches in diameter by 28 feet long, each with six 10-inch flues. The vessel draws less than 3 feet of water and it is claimed that she will be the fastest boat on the Ohio or Mississippi rivers.

Miller, Bull & Knowlton, vessel owners, New York, in a letter to the Review with reference to the report that they contemplated building two additional tramp steamers, state that they have no such intention, but that they have about contracted for the construction of a high class 14-knot steamer, with passenger accommodations for about sixty first-class

passengers and twenty-five second-class passengers for Porto Rico trade. A second similar boat is under consideration. The new cargo steamer Winifred, just completed at Bath, Me., for Mller, Bull & Knowlton, on her trial trip on Sept. 26 made 11.18 knots with a propeller 22 inches out of water and the vessel five feet by the stern. The Winifred sails for Porto Rico on her initial trip on Oct. 8.

Bids were opened by the navy department last Saturday for the four single-turreted monitors Arkansas, Connecticut, Florida and Wyoming, which were described and illustrated in the Review of Sept. 22. The bids were: Lewis Nixon, Crescent Ship Yard, Elizabeth, N. J., \$825,000; John H. Dialogue, Camden, N. J., \$1,171,000; Union Iron Works, San Francisco, \$875,000; Newport News Ship Building & Dry Dock Co., Newport News, Va., \$860,000; Wolff & Zwicker, Portland, Ore., \$937,500; Maryland Steel Co., Sparrows Point, Baltimore, \$876,000; Bath Iron Works, Bath, Me., \$862,000; W. & A. Fletcher Co., Hoboken, N. J., \$927,000; Columbian Iron Works, Baltimore, \$1,015,000. The contracts will probably be awarded to Nixon the Union Iron Works, the Newport News company and the Bath Iron Works.

HARBOR IMPROVEMENTS, MACHINERY, ETC.

Bids are asked for dredging at the Boston navy yard, estimated cost \$15,000.

Bids are asked until Oct. 18 for furnishing tools and machinery for the naval station, Puget Sound, Wash.

Bids asked by Oakland, Cal. board of public works for 600,000 cubic yards of dredging in Lake Merritt. Estimated cost \$80,000.

Henry D. Steers, Bowling Green, N. Y., is building the new pier at the foot of Watts street, North river, N. Y., at a cost of \$38,800.

Bids are asked, Oct. 26, for dredging in Providence river and Narragansett bay, R. I. Maj. D. W. Lockwood, U. S. engineer, Newport.

Bids are asked for dredging, filling and extending the reserve basin at the League Island navy yard, Philadelphia; appropriation \$120,000.

The Western Machine & Engine Co. of Tacoma, Wash., is erecting a \$5,000 shears at its yard. The legs are 100 feet in length by 30 inches in diameter.

Brown & Miller of Jersey City, N. J., have the contract for the joiner work for the steam lighter Iron King, building for Collyer Bros., New York.

J. A. Mitchell & Co. have finished their dredging contract at Luddington, Mich. There is now a uniform depth of 20 feet the entire length of the channel.

Bement, Miles & Co., Philadelphia, will supply two crank shaft lathes of immense size for the new ordnance machine shop of the Midvale Steel Co. at Nicetown, Pa.

Bids received for furnishing a barge for use in dredging at Biloxi, Miss., were as follows: W. N. Johnson, Biloxi, \$1,600; Kensington Engine Works, Ltd., Philadelphia, \$2,325.

J. S. Cram, commission of docks, pier A, North river, New York, will award the contract for 200,000 cubic yards of mud dredging in the North river at West 34th street.

Work has been commenced on the annex to the elevators of the Peavy Grain Co., 102d street and Calumet river, South Chicago, and plans are now being made for additional docks.

Crawley & Johnson, Cincinnati, O., have the contract to equip all five of the steel steamers building for the government at Dubuque, Ia., with their patent lever brake steam steering gear.

Bids asked, Oct. 19, for construction of 132,500 cubic yards of earthworks in Barataria levee district, Louisiana. Maj. J. H. Willard, U. S. engineer, 3232 Prytania street, New Orleans.

George H. Cavanagh, Boston, has the contract at \$13,690 for constructing two oak pile jetties and a channel 2,600 feet long and 100 feet wide through Dead Neck beach, Barnstable, Mass.

Contracts have been let to the Drake Stratton Co. of Pittsburg for the removal of 800,000 cubic yards of earth overburden from the Fayal and Biwabik mines, Mesabi range.

George A. Dentzel and Kennedy Crossman, Atlantic City, N. J., invite bids for the steel work for a steel pier to be constructed at States avenue, Atlantic City, with a frontage of 150 feet.

The Tonawanda Iron & Steel Co., North Tonawanda, N. Y. will build a dock 500 feet long on the Niagara river, connecting with and running south of the company's other dock. Edward H. Rogers of Tonawanda has the contract.

The Ellwood-Ivins Tube Co., Oak Lane Station, Philadelphia, has placed on the market special aluminum alloy tubes drawn on the outside of a steel tube, or on the inside, or both and especially adapted for hand rails on vessels.

The Bridgeport Steamboat Co. has offered to pay to the Brooklyn, N. Y. board of docks and ferries \$7,000 a year rental for a term of fifteen years for a pier to be erected adjoining Catharine Ferry, East River, N. Y.

The Pennsylvania Railroad Co. has decided to begin at once the erection of an extension to their trestles over the ore stock piles at Ash-tabula. It is claimed that the storage capacity will be increased several thousand tons thereby.

The contract for the superstructure which will be required in order to permit of the removal of the bridge pier obstruction in the Canadian canal at Sault Ste. Marie, mentioned in the Review some weeks ago, has been awarded to the Dominion Bridge Co.

The Thew Automatic Steam Shovel Co., Cleveland, has closed a contract for two large shovels for the Pittsburg, Bessemer & Lake Erie docks at Conneaut. The new shovels will have 4-ton buckets, their capacity being 46 cubic feet; radius of effective operation 25 feet.

The Macdonald Dredging Co. of New York has been incorporated with a capital stock of \$50,000 by Henry H. Graff, Ernest Atkinson, Frederick W. Craig, and Charles Engel of New York City and Thomas Holden, Jr. of White Plains, N. Y. They will at once construct or lease several steamers and dredges.

Eugene Lentillon, Pier A., North River, New York, has secured the contract for the erection of the steel machinery construction and storage house at the Brooklyn navy yard at \$15,300. Other bidders were: Youngstown Bridge Co., Youngstown, O., \$15,347; McGuire & Hall, 26 Cortlandt st., N. Y., \$15,989.

Contracts in Lake Ship Yards.

J. E. Henderson, general agent of the People's Steamship Co. of Detroit, is given as authority for the statement that the company is considering the establishment of a passenger line from Detroit to Sault Ste. Marie.

W. F. Dalzell, 70 South street, New York, well known as an owner of tugs, is at St. Paul and has announced his intention of making a tour of lake ship building yards, which fact has given rise to the rumor that he anticipates awarding a contract here for a couple of boats for New York service.

Capt. James Davidson, who was in Cleveland recently, says he has not made up his mind as yet regarding building operations during the coming winter. He has talked of building two or three wooden tow barges but his plans are not at all definite as yet. He is figuring with harbor towing companies at Buffalo and other places for the construction of a couple of tugs.

Mr. C. F. Bielman, treasurer and traffic manager of the Star-Cole, Red and White Star Steamship lines of Detroit, operating passenger steamers on the Detroit and St. Clair rivers, informs the Review that his company expects to let a contract shortly for the construction of a new river steamer. Plans are being prepared but details have not been perfected. The present intention is to have the new boat modeled after the steel steamer New York, now in service on the Hudson river, and the dimensions will likely be about 375 feet length by 75 feet beam, the vessel having a capacity of 4,000 passengers.

The Cleveland Ship Building Co. has two steel steamers to build during the coming winter. Both are to be big cargo carriers of the 6,000-gross-ton type. One is for Capt. Thomas Wilson of Cleveland, and the other, according to persistent rumor, is for Mr. A. B. Wolvin and others of Duluth. Mr. James Wallace, general manager of the Cleveland company, still insists, however, that the so-called Wolvin boat is as yet a stock job undertaken by the ship building company. The new Wilson steamer will be almost equal in dimensions to the Rockefeller steamer Morse, which is the largest vessel on the lakes. The improved condition of lake freights and the transfer of a very large amount of old tonnage to the Atlantic coast (some 70,000 tons capacity) will probably result in the lake ship yards having about as much as they can do in new work and repairs during the winter.

Look to the Life Boats.

Editor Marine Review:—It can hardly be expected that the coming tempestuous season at sea and on the lakes will pass without accidents from many causes where vessels, in order to save life, will be compelled to resort to their small boats. How many of the vessels that navigate the lakes and sea have their small boats so equipped as to be able to lower and detach them in case of necessity? This is a matter that concerns those most who have to unhook and hook on the boats. They have no voice in the matter of whether the boats are equipped with reliable devices or not, but when the time comes to make a rescue they unhesitatingly take their places in the boat and are lowered away, be it either night or day, rough or smooth. It is unfortunate that those who have to perform a duty of this kind are not in position to demand the proper appliances to do such perilous work, in order that they may more successfully accomplish this duty with less danger and peril to themselves. But poor Jack never stops to think about himself, or the uncertainties that attend such sacrifice to duty. He jumps into the boat and is lowered away, little heeding the uncertainty of being able to detach his boat and get off from the side of the ship quickly. With boats properly constructed and equipped the chances are greater for the accomplishment of the object with safety and certainty for which they are launched.

Many instances are on record where vessels are passed by in distress, and the unfortunate victims are left to their fate, because the roughness of the sea made the safe launching of a boat an impossibility; whereas, had the boats been suitably equipped so they could have been detached when lowered, a rescue might have been made fraught with less peril and danger to those making it. In the equipment of all ships, either passenger or freight, steam or sail, particular attention should be given to the boats and the appliances for handling them. There are laws specific and forcible that govern these matters, but from causes best and only known to those whose duty it is to enforce them they are treated as a dead letter, and the matter left to the owners and builders of vessels, who very often, through ignorance of the necessity of such appliances or a desire to economize cost, totally disregard this essential feature of a ship's equipment, which humanity, if not the law, ought to compel them to adopt.

Chicago, Sept. 28, 1898.

AN EX-CAPTAIN.

Steel Barges on the Mississippi.

Capt. Alex. McDougall of the American Steel Barge Co., West Superior, Wis., some time ago suggested the idea of operating steel barges on the Mississippi river. His plan was to build propellers and tow barges, and operate them in tows, similar to the system that prevails on the lakes. Several prominent citizens of St. Louis have now taken up the suggestion and are trying to form a company that will build a line of the proposed new type of river boat. It is planned to have Capt. McDougall superintend construction of the vessels. The new vessels, if built, will be a radical innovation for Mississippi river trade where all the barges utilized heretofore have been of wood. The new line, should it be established, will also entirely revolutionize the method of handling barges now in vogue on the river. The old style paddle wheels will, of course, be replaced by screw propellers, and instead of a number of barges being lashed together and pushed by a towboat, they will be towed in single file. This arrangement will, it is claimed, permit a fleet to make the passage of a much narrower channel, at a lower stage of water than by the plan now in use, and will also permit of the rounding of the most abrupt bends without reduction of speed. Great carrying capacity on light draft is, of course, promised in the new vessels.

Capt. Alexander Ruelle, Detroit tug owner, died a few days ago.

In General.

Announcement is made by the International Navigation Co. of the resumption of their fast express service between New York and Southampton, beginning with the sailing of the St. Louis Oct. 12, to be followed by the St. Paul Oct. 19 and the Paris Oct. 26.

The new steel steamer Bay State, built by Harland & Wolff, Belfast, for George Warren & Co., Liverpool, and intended to run between Boston and Liverpool, has had a successful trial. The steamer, which is of about 7,000 gross registered tons, is 490 feet over all, 52 feet beam and 36 1-3 feet deep.

During the past year the ship yards of Seattle, Wash., have turned out seventy-three vessels, fifty of which were steamships, twelve barges, seven schooners and three scows. Of this number, fifty-seven were built for the Alaska trade. Their total tonnage, however, did not amount to over 25,000.

The largest bulk oil carrier in the world, the Tuscarora, has just been completed at Sunderland, England, for the Anglo-American Oil Co. She has a length of 420 feet, 53 feet beam, 29 feet depth of hold and a carrying capacity of 2,000,000 gallons. The Tuscarora will trade from Philadelphia and New York to British ports.

Mr. J. Pierpont Morgan is to have one of the finest steam yachts in the country. J. Beavor-Webb is the designer and he has specified Howden hot draft. The draft will be applied under direction of the Dry Dock Engine Works of Detroit, as that concern holds Howden draft rights for practically the entire country. Horse power of the Morgan yacht will aggregate 4,950.

United States naval officers will make every effort to have this country retain possession of the large floating dry dock purchased by the Spanish government and towed to Havana just before the outbreak of the war. It is of sufficient size to accommodate any of our battleships, and the officers argue that as it is not automobile it can rightfully be retained.

A comparison has been made on Howard Gould's new yacht Niagara of inward and outward turning propellers. With the inward turning screws at 128 revolutions per minute the speed was 12.58 knots, while with the outward turning screws at 120 revolutions the speed was 14½ knots. Full particulars of the trial are not given.

Francis T. Bowles, secretary of the Society of Naval Architects and Marine Engineers, has issued to members the formal notice of the annual meeting, to be held in the auditorium at 12 West Thirty-first street, New York on Thursday and Friday, Nov. 9 and 10. The program showing the list of papers to be read will be ready about Oct. 15.

One of the largest checks ever made out for sight payment was that drawn recently by the treasurer of the United States to the order of the International Navigation Co. for \$1,475,000. This sum is the rental for the steamships St. Paul, St. Louis, Harvard and Yale, chartered by the government at the beginning of the war. The sum is approximately \$12,000 per day, or \$3,000 for each vessel.

It is understood that the Union Iron Works of San Francisco will use Ward water tube boilers in the 18-knot battleship, for which they will receive a contract from the government in a few days. This is the boiler that was used in connection with cylindrical boilers in the coast defense vessel Monterey, built in San Francisco in 1890. The bureau of steam engineering, navy department, seems to regard the Ward boiler with considerable favor.

Trade Notes.

The Shelby Steel Tube Co.'s weldless tube mill at Greenville, has been put in operation after an idleness of two months. Thirty-one new draw benches for the larger tubing are being put in to be run by hydraulic power.

Steel work for the Memorial hall, being erected at Westerly, R. I., will be furnished by the Berlin Iron Bridge Co. of East Berlin, Conn., which company also has the contract for considerable steel roof work for the new plant of Holmes, Booth & Hagdens, Waterbury, Conn.

A most favorable record has been made by the small traveling cableway supplied by the Lidgerwood Mfg. Co., New York, a few months ago, for use in the construction of fortifications at Fort Pickens, Fla. It has been possible with this cableway to handle an average for fourteen days of 830 tons per day, the maximum day's work being 1,000 tons.

Mr. C. E. Bigelow retires from the presidency of the Geo. F. Blake Mfg. Co., New York, to accept the presidency of the Gansevoort bank of New York, an institution that he helped to organize some years ago. Recently, employees of the Blake company presented him with a testimonial of their respect and appreciation in the shape of a handsome gold-headed ebony cane. The presentation was made by Mr. F. M. Wheeler with a few appropriate remarks. Mr. Bigelow has served faithfully in the employ of the Knowles Steam Pump Works and the Blake company for a period of nearly thirty-two years, and during the last four years as president of the Blake company. The directors adopted a set of resolutions expressing their sincere regret at his being obliged to sever his connections with the company, and wishing him the greatest success in his new field of usefulness.

Lieut. Geo. L. Carden of the United States revenue cutter service, who examined for the government, some time ago, all the ship and engine building plants on the lakes, and who has had considerable to do with the building of the three first-class revenue cutters recently turned out by the Globe Iron Works Co. of Cleveland, is greatly impressed with the facilities of the Lake Erie Engineering Works of Buffalo. He says that Irving M. Scott told him that when he founded the present extensive plant of the Union Iron Works, San Francisco, he looked over a great many big engineering plants throughout the country, and finally took the boiler shop of the Lake Erie works as a basis.

Secretary Long of the navy department has formally awarded contracts for the new coast defense monitors as follows: Lewis Nixon, Elizabeth, N. J., one monitor, \$825,000; Newport News Ship Building & Dry Dock Co., Newport News, Va., one at \$860,000; Bath Iron Works Bath, Me., one at \$862,000; and Union Iron Works, San Francisco, one at \$875,000.

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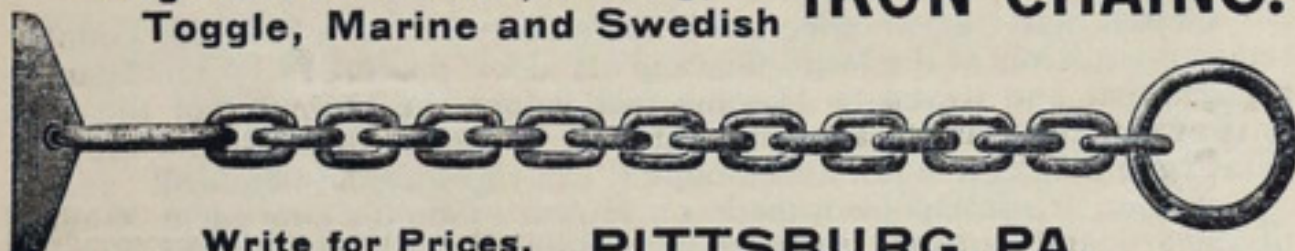
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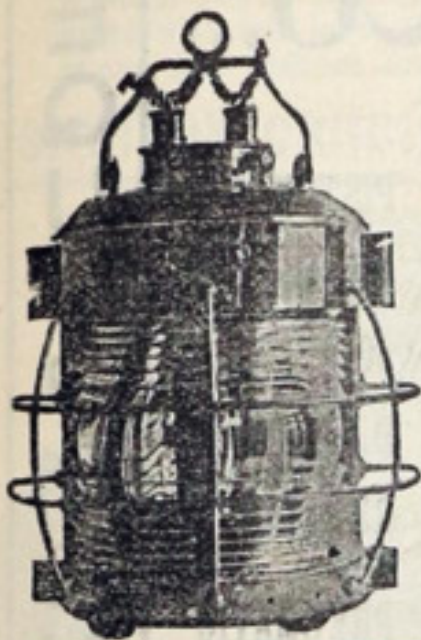
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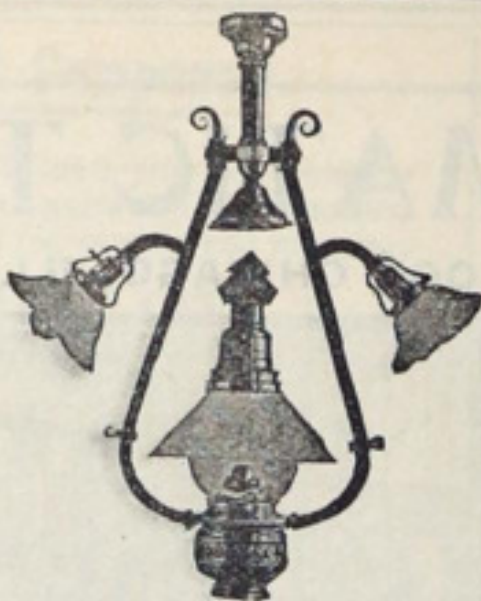


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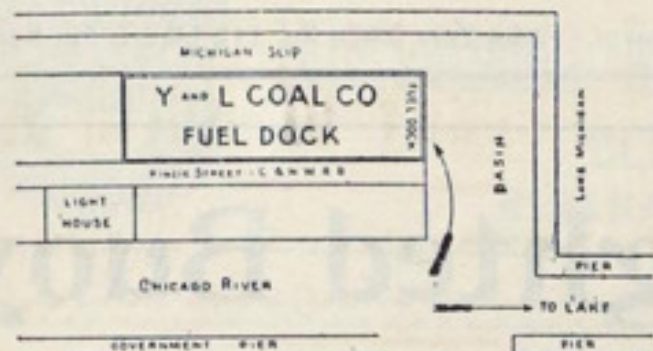
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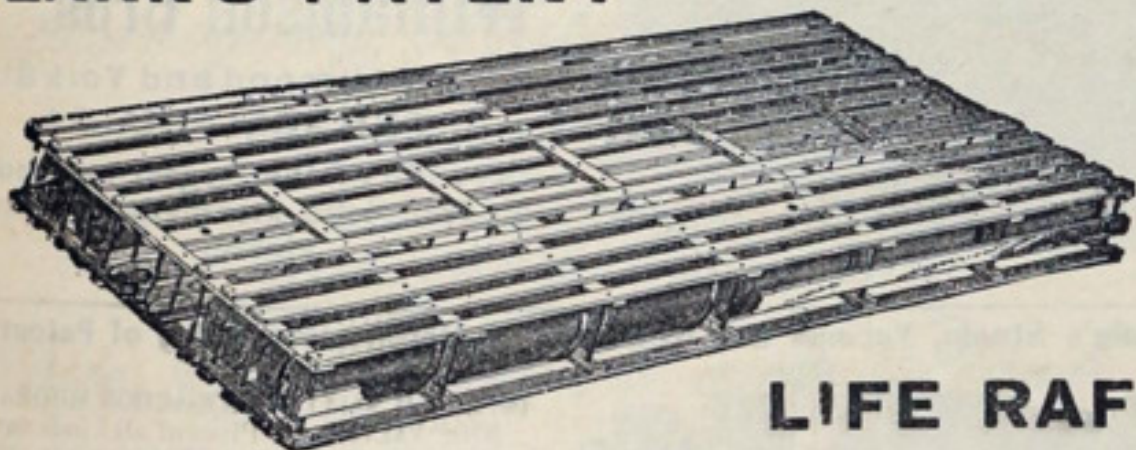
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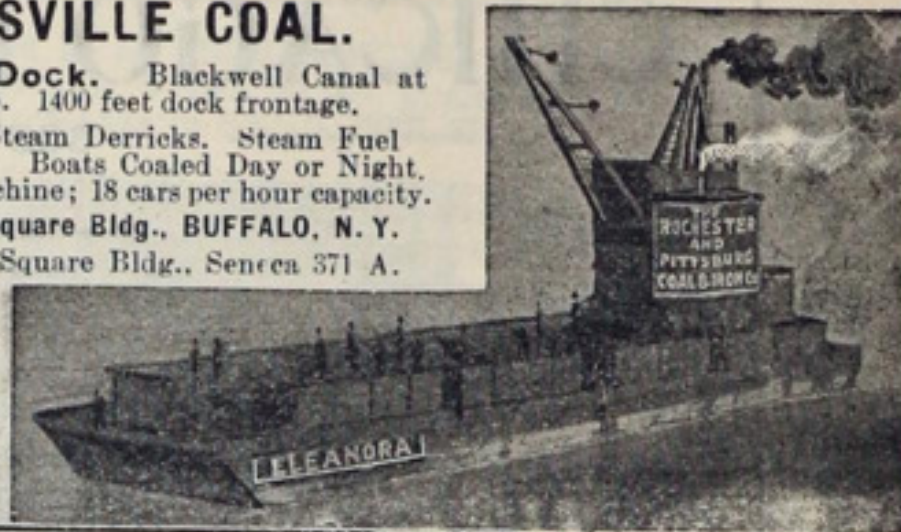
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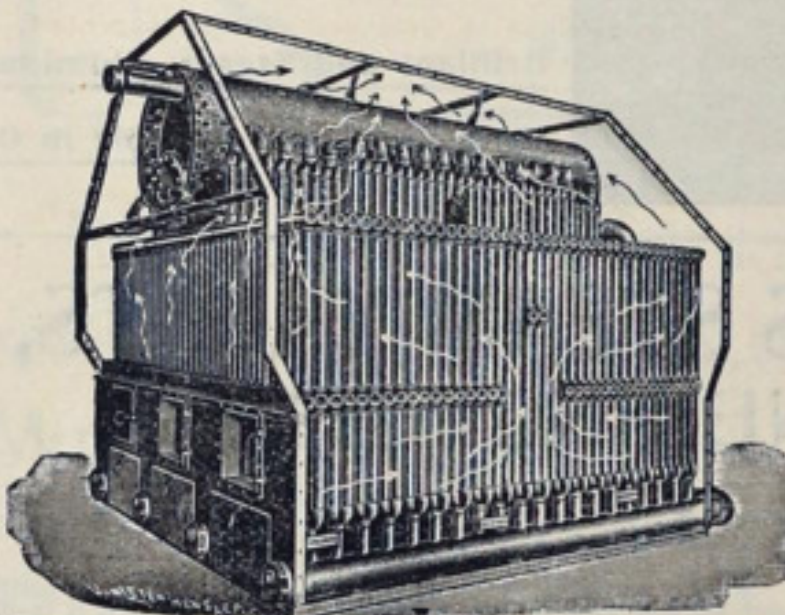
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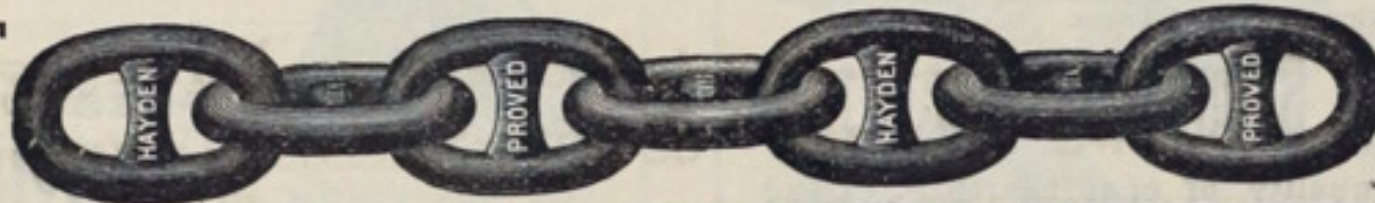


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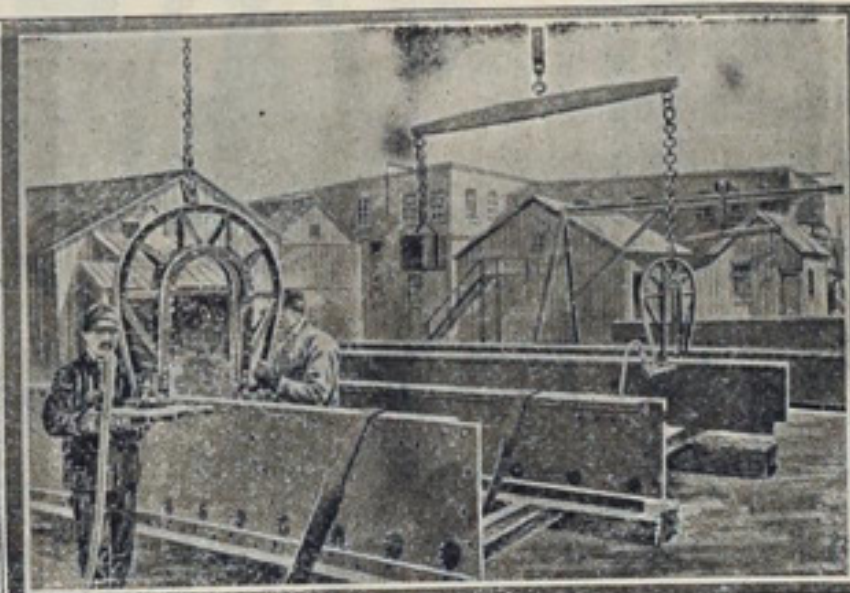
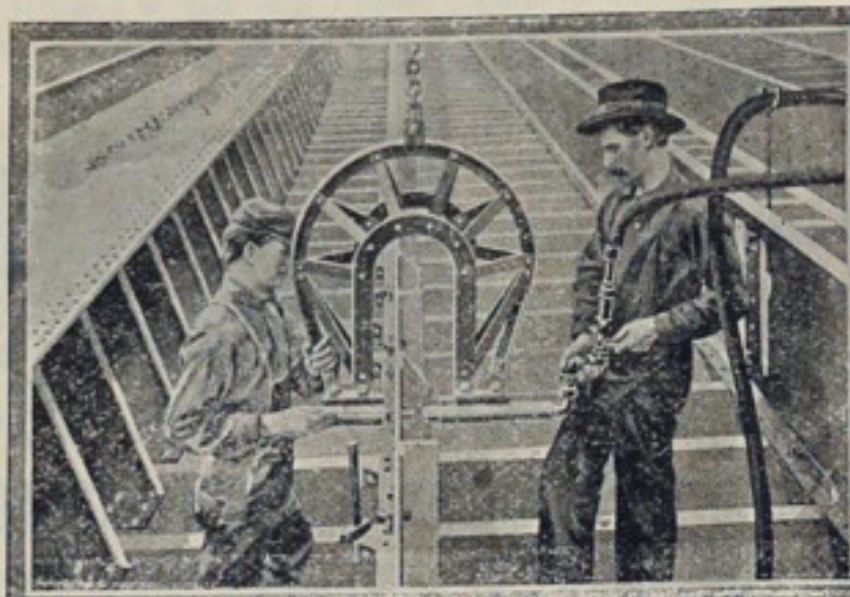


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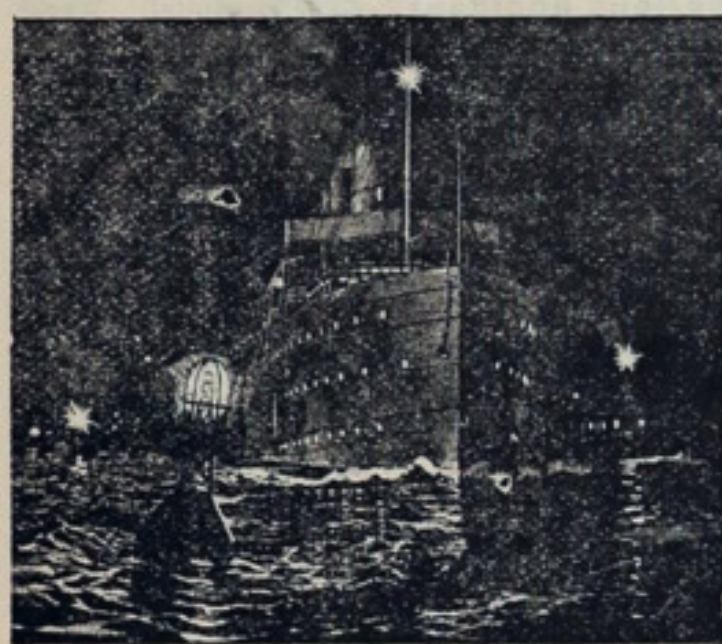
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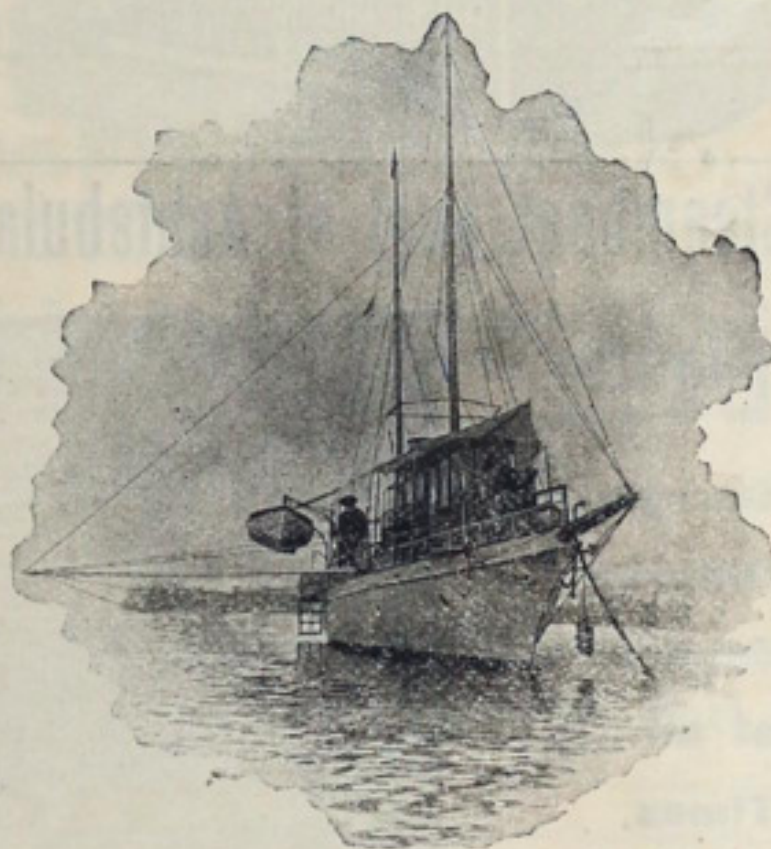
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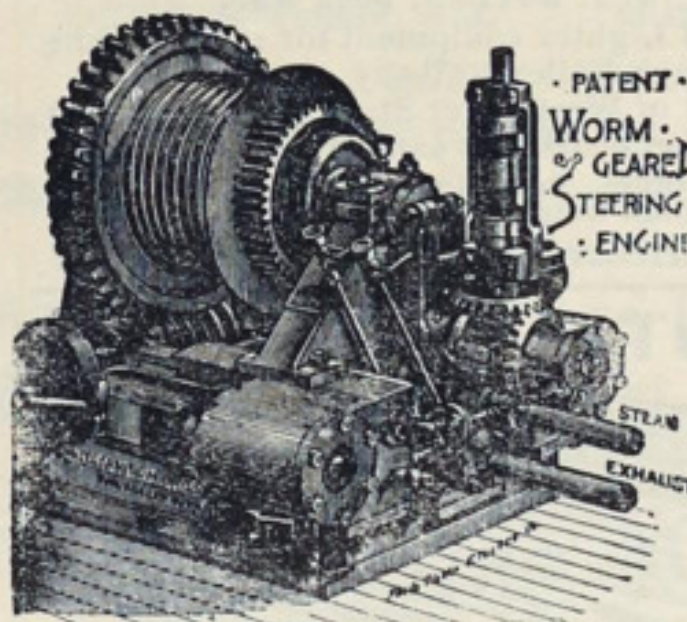
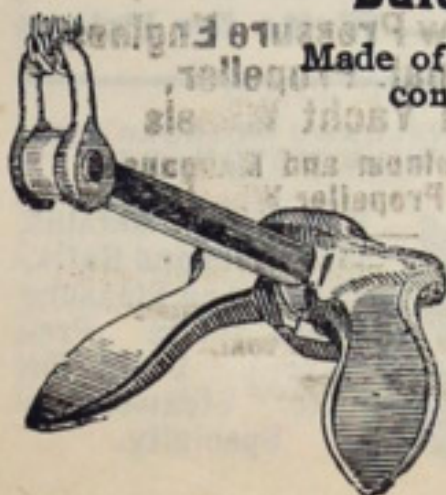
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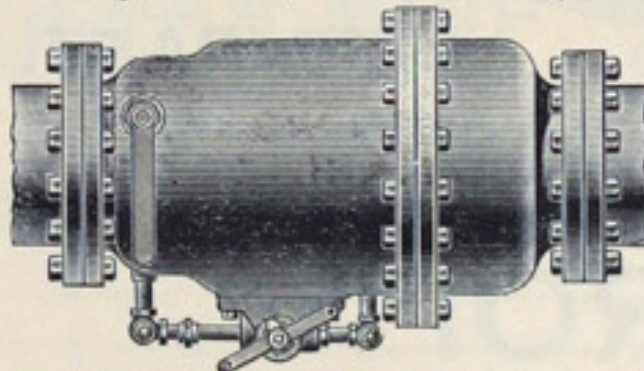
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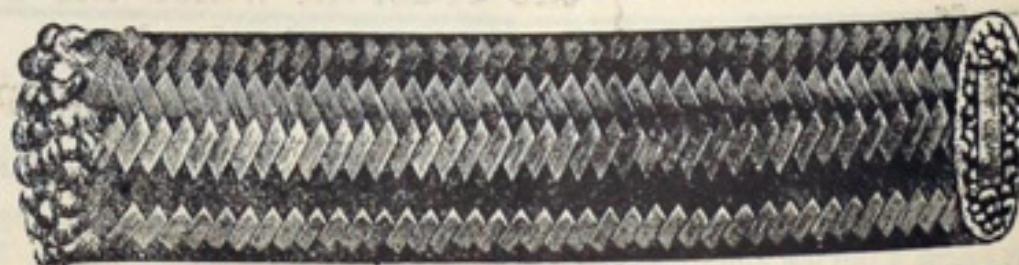
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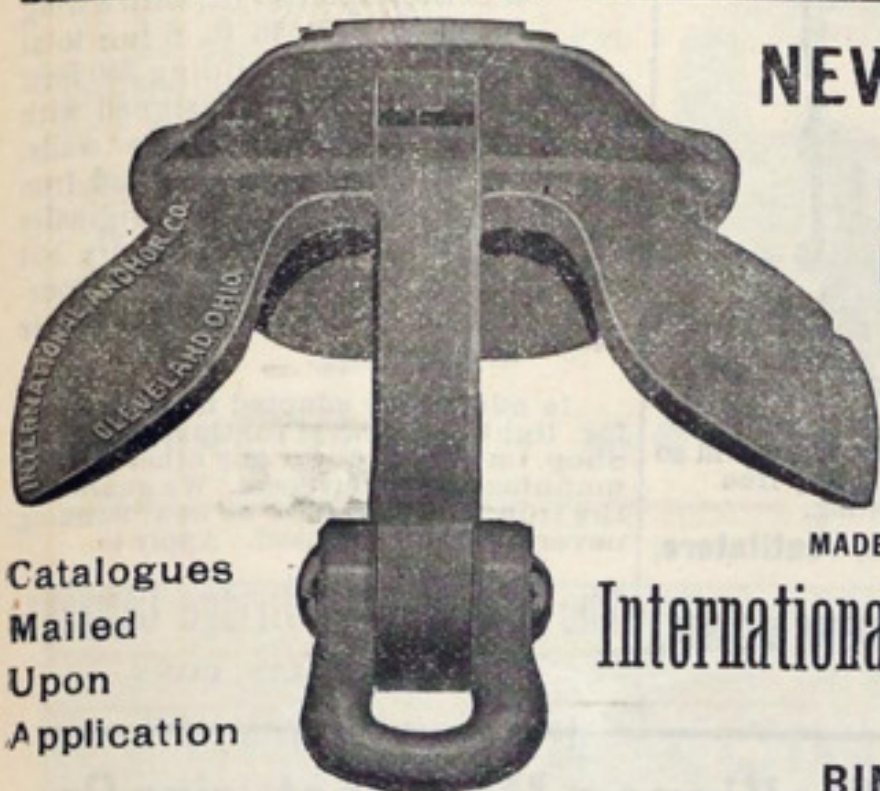
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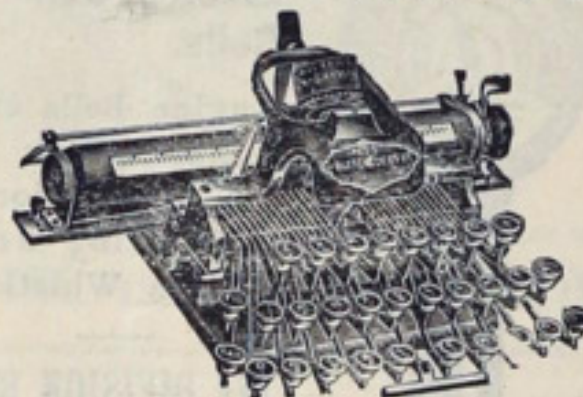
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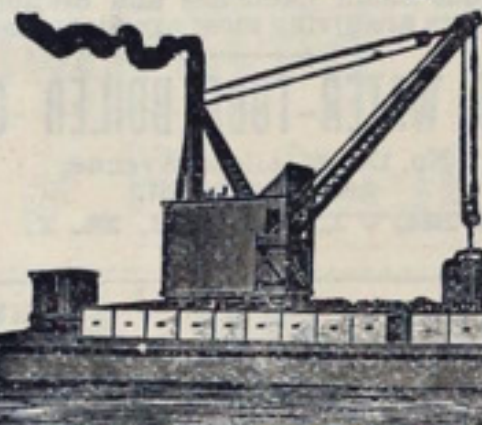
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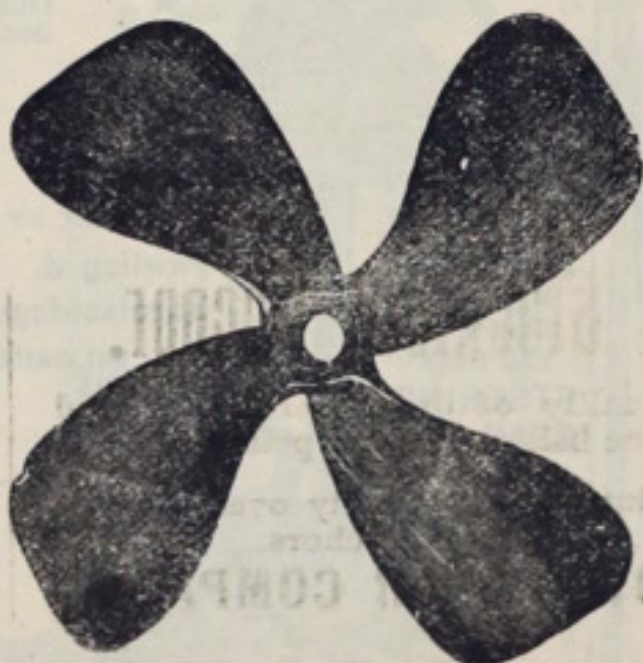
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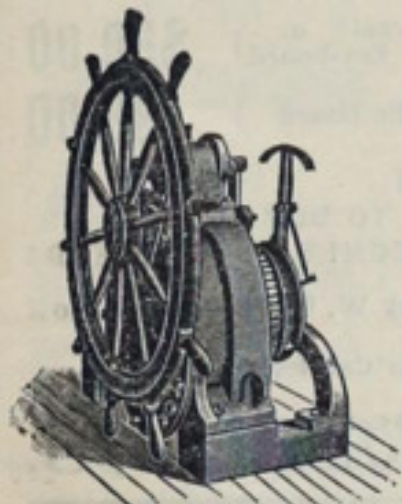


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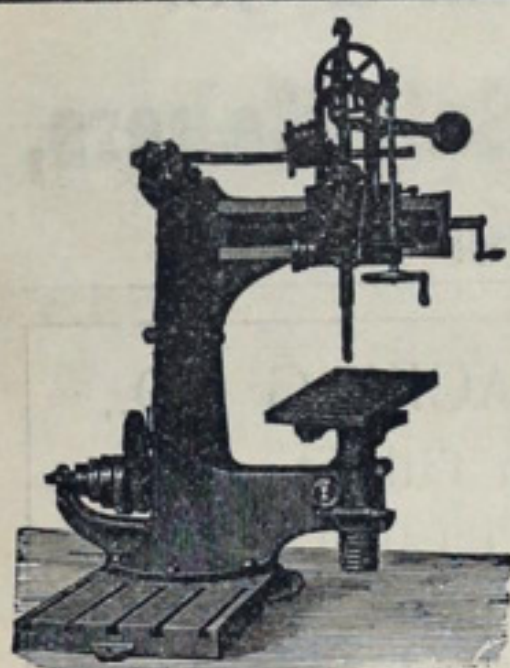
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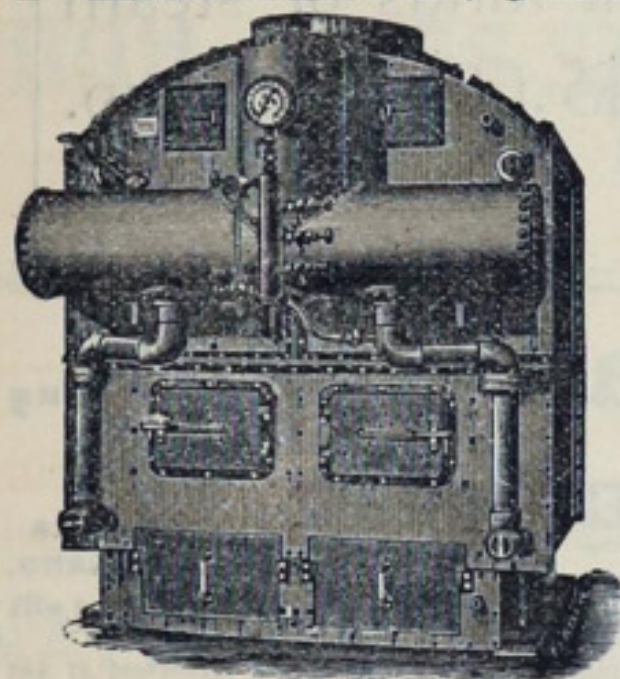
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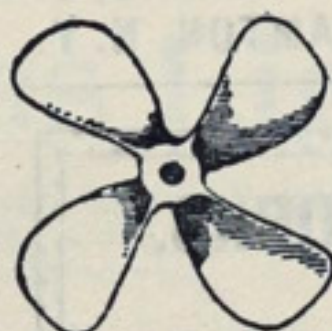
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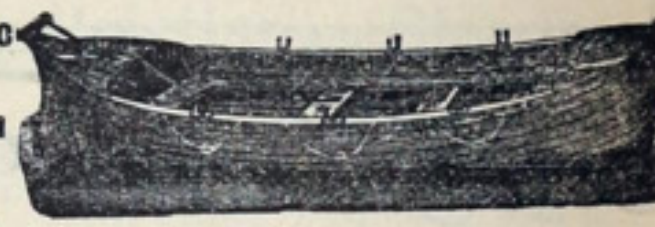
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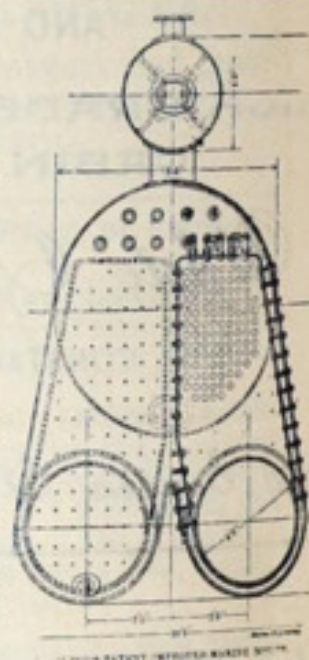
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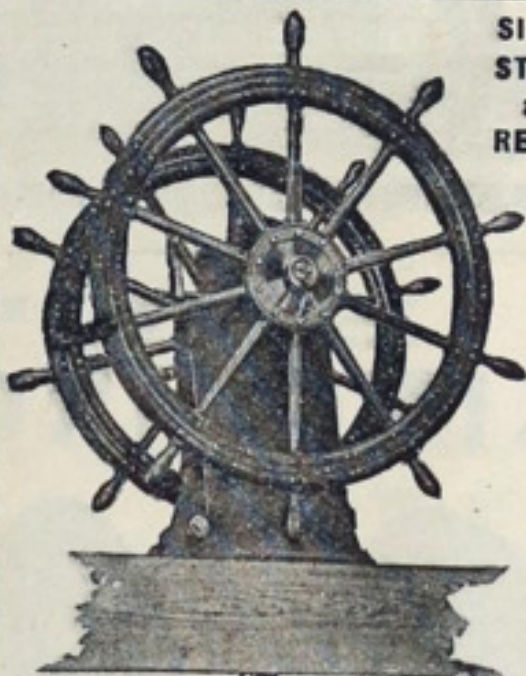


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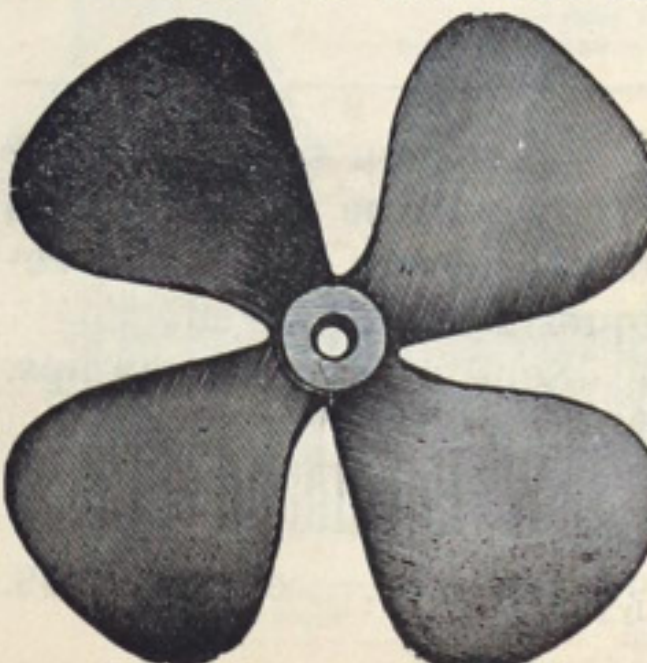
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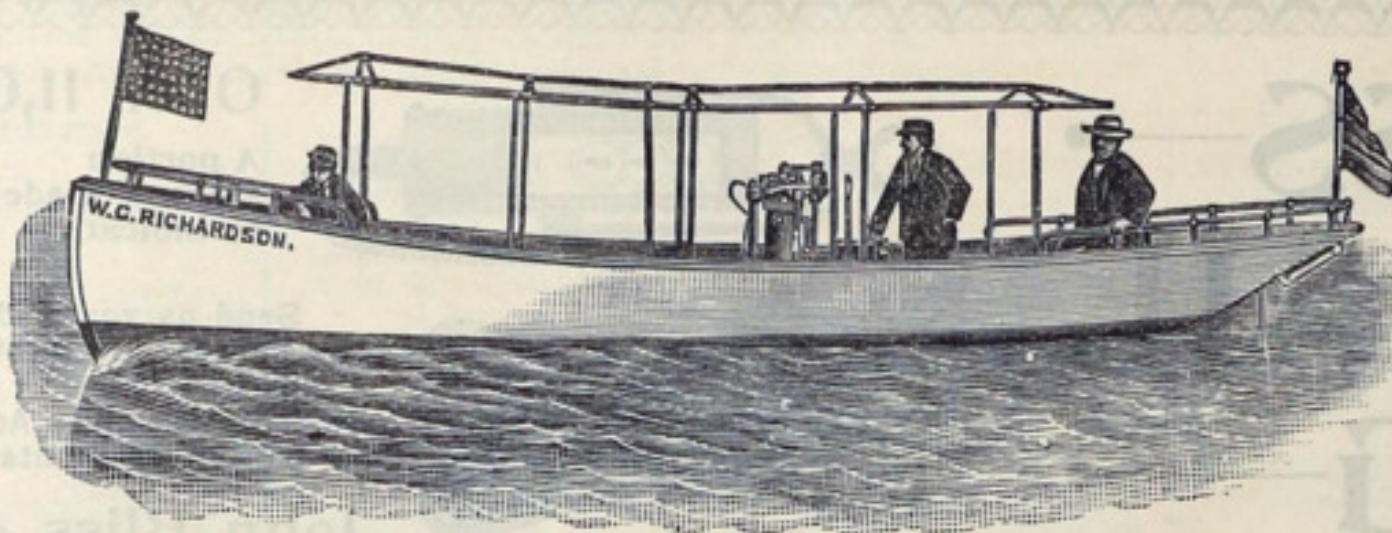


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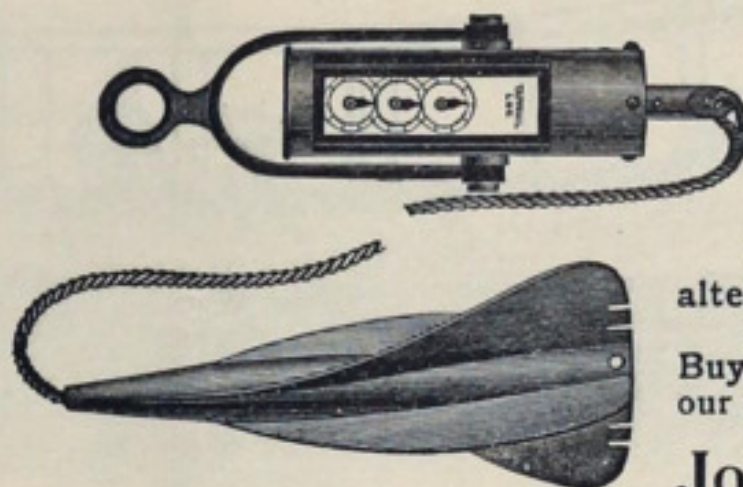
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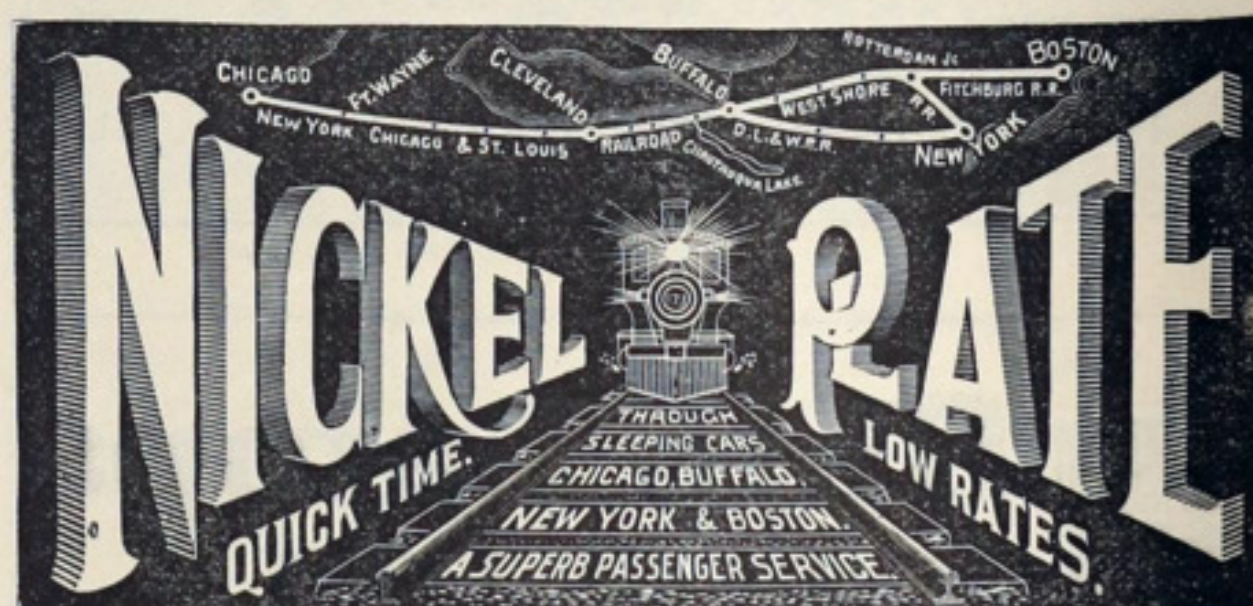


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BOILER PLATES.

Bourne-Fuller Co. Cleveland.

BOILER TUBES, SEAMLESS, COLD DRAWN.

Shelby Steel Tube Co. Cleveland.

BOILER FURNACES, FIRE FRONTS AND DOORS.

Continental Iron Works. New York.

BOILER AND PIPE COVERING.

H. W. Johns Mfg. Co. New York.

BRASS AND BRONZE CASTINGS.

Chas. Cory & Son. New York.
Standard Brass Works. Kalamazoo, Mich.
Magnolia Metal Co. New York.
Detroit Sheet Metal & Brass Works. Detroit.

BRIDGES, BUILDINGS, STRUCTURAL WORK.

Berlin Iron Bridge Co. East Berlin, Conn.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co. Cleveland.

CHAINS.

P. Hayden S. H. Co. Columbus, O.
James McKay & Co. Pittsburgh, Pa.
J. B. Carr Co. Troy, N. Y.

CHARTS AND SAILING DIRECTIONS.

Marine Review. Cleveland.

CIRCULATING DEVICES FOR BOILERS.

H. Bloomsburg & Co. Newport News, Va.

CLASSIFICATION OF VESSELS.

Great Lakes Register. Chicago.

COAL DEALERS.

See fueling concerns and coal shippers.

COAL SHIPPERS.

Cuddy-Mullen Coal Co. Cleveland.
M. A. Hanna & Co. Cleveland.
Pickands, Mather & Co. Cleveland.
W. L. Scott Co. Erie, Pa.
Rochester & Pittsburgh Coal & Iron Co. Buffalo.
Pittsburgh & Chicago Gas Coal Co. Cleveland.
Youghloheny River Coal Co. Erie, Pa.
Osborne, Saeger & Co. Cleveland.
Castner, Curran & Bullitt (Pocahontas). Philadelphia.

COAL AND ORE HANDLING MACHINERY.

Brown Hoisting & Conveying Mach. Co. Cleveland.
McMyler Mfg. Co. Cleveland.
Lidgerwood Mfg. Co. New York.

COMPASSES.

John Bliss & Co. New York.
L. Black & Co. Detroit.

CAPSTANS.

American Ship Windlass Co. Providence, R. I.
Hyde Windlass Co. Bath, Me.

COPPER AND SHEET IRON WORK.

Detroit Sheet Metal & Brass Works. Detroit.

COMPASS ADJUSTER.

Geo. A. Simpson. Sault Ste. Marie, Mich.

CRANES.

Brown Hoisting & Conveying Mach. Co. Cleveland.
McMyler Mfg. Co. Cleveland.
Lidgerwood Mfg. Co. New York.

CONDENSERS.

See pumps.

CONTRACTORS FOR PUBLIC WORKS.

Cleveland Dredge Co. Cleveland.
W. A. McGillis & Co. Cleveland.

CORDAGE.

See ship chandlers.

CORK JACKETS AND RINGS.

Armstrong Cork Co. Pittsburgh, Pa.

DIVING APPARATUS.

A. J. Morse & Son. Boston.

DREDGING AND DOCK CONTRACTORS.

W. A. McGillis & Co. Cleveland.
Cleveland Dredge Co. Cleveland.

DRY DOCKS.

American Steel Barge Co. West Superior, Wis.
Chicago Ship Building Co. Chicago.
Craig Ship Building Co. Toledo, O.
Detroit Dry Dock Co. Detroit.
Milwaukee Dry Dock Co. Milwaukee.
Newport News Ship Bldg. & Dry Dock Co. Newport News, Va.
Ship Owners' Dry Dock Co. Cleveland.
Cleveland Ship Building Co. Lorain.
Union Dry Dock Co. Buffalo.

ENGINE BUILDERS, MARINE.

Farrar & Trefts. Buffalo.
W. & A. Fletcher Co. Hoboken, N. J.
Frontier Iron Works. Detroit.
Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated. New York.
S. F. Hodge & Co. Detroit.
Mackinnon Mfg. Co. Bay City, Mich.
B. F. Sturtevant Co. Boston.
Globe Iron Works Co. Cleveland.
Cleveland Ship Building Co. Cleveland.
Chase Machine Co. Cleveland.
H. G. Trout. Buffalo.
Dry Dock Engine Works. Detroit.
American Steel Barge Co. West Superior, Wis.
Chicago Ship Building Co. Chicago.
Sheriff Mfg. Co. Milwaukee.

ENGINE ROOM TELEGRAPH.

Chas. Cory & Son. New York.
Chadburn & Sons. 11 Waterloo Rd., Liverpool.

ENGINEERS' SUPPLIES.

Detroit Sheet Metal & Brass Works. Detroit.

Chase Machine Co. Cleveland.

ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co. Schenectady, N. Y.

B. F. Sturtevant Co. Boston.

ELECTRIC HOISTS.

General Electric Co. Schenectady, N. Y.
Lidgerwood Mfg. Co. New York.

ENGINEERS, CONSULTING (MECHANICAL AND MARINE).

Miers Coryell. New York.
John Haug. Philadelphia.
Ambrose V. Powell. Chicago.
W. J. Wood. Chicago.
Walter Miller. Cleveland.
Joseph R. Oldham. Cleveland.

EOPHONES.

Eophone Co. New York.

FANS FOR VENTILATION.

American Blower Co. Detroit.

B. F. Sturtevant Co. Boston.

FEED WATER PURIFIER AND HEATERS.

Robert Learmonth. Buffalo.

FORGINGS, IRON AND STEEL.

Cleveland City Forge & Iron Co. Cleveland.

Bethlehem Iron Co. South Bethlehem.

FORWARDERS OF FREIGHT.

Thomas Wilson. Cleveland.
C. H. Tucker. Cleveland.

Bessemer Steamship Co. Cleveland.

FUELING COMPANIES AND COAL DEALERS.

Cuddy-Mullen Coal Co. Cleveland.
James Graham & Co. Detroit.
M. A. Hanna & Co. Cleveland.
Mark H. Hanlon. Cleveland.
Pickands, Mather & Co. Cleveland.
O. S. Richardson Fueling Co. Chicago.
Stanley B. Smith & Co. Detroit.
Pittsburgh & Chicago Gas Coal Co. Cleveland.
Rochester & Pittsburgh Coal & Iron Co. Buffalo.
Port Royal Dock Co. Sault Ste. Marie, Mich.
W. L. Scott Co. Erie, Pa.
Youghloheny River Coal Co. Ashtabula.
Youghloheny & Lehigh Coal Co. Chicago.
Osborne, Saeger & Co. Cleveland.
Castner, Curran & Bullitt (Pocahontas). Philadelphia.

FLAGS AND BUNTING.

See ship chandlers.

FIXTURES FOR LAMPS, OIL AND ELECTRIC.

Wm. Porter's Sons. New York.

Page Bros. & Co. Boston.

FURNACES FOR BOILERS.

Continental Iron Works. New York.

GAS BUOYS.

Safety Car Heating & Lighting Co. New York.

GAS ENGINES.

Frontier Iron Works. Detroit.

McMyler Mfg. Co. Cleveland.

GLASSES, MARINE.

See ship chandlers and dealers in nautical instruments.

GAUGES, STEAM.

Crosby Steam Gauge & Valve Co. Boston.

See also valves and engineers' supplies.

GRAPHITE.

Joseph Dixon Crucible Co. Jersey City, N. J.

GREASE CUPS.

See engineers' supplies.

HEATERS, STEAM.

American Blower Co. Detroit.

HARDWARE, MARINE.

L. W. Ferdinand & Co. Boston.

Detroit Sheet Metal & Brass Works. Detroit.

HOISTING ENGINES.

Chase Machine Co. Cleveland.

S. F. Hodge & Co. Detroit.

Jackson & Church. Saginaw.

Lidgerwood Mfg. Co. New York.

Marine Iron Co. Bay City.

Globe Iron Works Co. Cleveland.

Williamson Bros. Philadelphia.

Hyde Windlass Co. Bath, Me.

HOSE, DECK AND FIRE PURPOSES.

The Manhattan Rubber Mfg. Co. New York, Cleveland and Chicago.

HAMMERS, POWER DROP.

Chase Machine Co. Cleveland.

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Jenkins Bros. New York.

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Chas. E. & W. F. Peck. New York and Chicago.

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M. A. Hanna & Co. Cleveland.

Pickands, Mather & Co. Cleveland.

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Armstrong Cork Co. Boston.

Detroit Sheet Metal & Brass Works. Detroit.

Thos. Drein & Son. Wilmington, Del.

D. Kahnweiler. New York.

LIGHTS, PORTABLE, SELF-CONTAINED.

The Wells Light Mfg. Co. New York.

LIGHTS, SIDE AND SIGNAL.

Page Bros. & Co. Boston.

Wm. Porter's Sons. New York.

MANILA ROPE.

Upson-Walton Co. Cleveland.

H. H. Baker & Co. Buffalo.

MARINE GLASSES, BAROMETERS, ETC.

L. Black & Co. Detroit.

John Bliss & Co. New York.

Also most of the ship chandlers.

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U. S. Metallic Packing Co. Philadelphia.

L. Katzenstein & Co. New York.

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METALS FOR BEARINGS.

Magnolia Metal Co. New York.

Phosphor Bronze Smelting Co., Ltd. Philadelphia.

MAGNOLIA METAL.

Magnolia Metal Co. New York.

METALLIC LIFE BOATS.

Thos. Drein & Son. Wilmington, Del.

D. Kahnweiler. New York.

MARINE GLUE.

L. W. Ferdinand & Co. Boston.

NAUTICAL INSTRUMENTS.

John Bliss & Co. New York.

L. Black & Co. Detroit.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

NAPHTHA LAUNCHES.	
Gas Engine & Power Co.	New York.
NAVAL ARCHITECTS.	
Frank E. Kirby	Detroit.
W. J. Wood	Chicago.
John Haug	Philadelphia.
Joseph R. Oldham	Cleveland.
Robert Curr	Cleveland.
OAK TIMBER AND PLANK.	
Martin-Barriss Co.	Cleveland.
OILS AND LUBRICANTS.	
Jos. Dixon Crucible Co.	Jersey City, N. J.
Lake Carriers' Oil Co.	Cleveland.
Standard Oil Co.	Cleveland.
PATENT ATTORNEY.	
Wm. M. Monroe	Cleveland.
PASSENGER AND FREIGHT STEAMSHIP LINES.	
Cleveland & Buffalo Transit Co.	Cleveland.
Detroit & Cleveland Navigation Co.	Detroit.
Goodrich Transportation Co.	Chicago.
Lackawanna-Green Bay Line, C. H. Tucker	Cleveland.
Lake Michigan & Lake Superior Trans. Co.	Chicago.
Northern Steamship Co.	Buffalo.
Ogdensburg Transit Co.	Ogdensburg, N. Y.
Northern Transit Co.	Cleveland.
Graham & Morton Trans. Co.	Chicago.
PNEUMATIC TOOLS.	
Chicago Pneumatic Tool Co.	Chicago.
POCAHONTAS COAL.	
Castner, Curran & Bullitt	Philadelphia.
PROPELLER WHEELS.	
Dry Dock Engine Works	Detroit.
Cleveland Ship Building Co.	Cleveland.
Globe Iron Works Co.	Cleveland.
Farrar & Trefts	Buffalo.
S. F. Hodge & Co.	Detroit.
Phosphor Bronze Smelting Co., Ltd.	Philadelphia.
Mackinnon Mfg. Co.	Bay City.
Sheriffs Mfg. Co.	Milwaukee.
H. G. Trout	Buffalo.
Frontier Iron Works	Detroit.
Hyde Windlass Co.	Bath, Me.
PRESSURE REGULATORS AND REDUCING VALVES.	
G. M. Davis & Co.	Chicago.
Foster Engineering Co.	Newark, N. J.
PACKING.	
A. W. Chesterton & Co.	Boston.
H. W. Johns Mfg. Co.	New York.
Jenkins Bros.	New York.
L. Katzenstein & Co.	New York.
Manhattan Rubber Mfg. Co.	New York.
U. S. Metallic Packing Co.	Philadelphia.
Peerless Rubber Mfg. Co.	New York.
PAINTS.	
Upson-Walton Co.	Cleveland.
Howard H. Baker & Co.	Buffalo.
PUMPS, STEAM.	
Geo. F. Blake Mfg. Co.	New York.
Henry R. Worthington	New York.
PUMPS, ELECTRIC.	
General Electric Co.	Schenectady, N. Y.

RELEASING HOOKS FOR DETACHING BOATS.	
Standard Aut. Releasing Hook Co.	New York.
RIVETS, STEEL.	
Bourne-Fuller Co.	Cleveland.
RUBBER GOODS FOR STEAMERS.	
Manhattan Rubber Mfg. Co.	New York and Cleveland.
Peerless Rubber Mfg. Co.	New York.
RUBBER INSULATED WIRES.	
John A. Roebling's Sons Co.	New York and Cleveland.
SAIL MAKERS.	
Howard H. Baker & Co.	Buffalo.
Upson-Walton Co.	Cleveland.
SHIP PLATES, STEEL.	
Bourne-Fuller Co.	Cleveland.
SALVAGE COMPANIES.	
See wrecking companies.	
SEARCH LIGHTS.	
General Electric Co.	Schenectady, N. Y.
SURVEYORS, MARINE.	
Robert Curr	Cleveland.
Capt. D. McLeod	Cleveland.
Joseph R. Oldham	Cleveland.
SHIP CHANDLERS.	
Howard H. Baker & Co.	Buffalo.
Upson-Walton Co.	Cleveland.
SOUND DETECTORS.	
Eophone Co.	New York.
STEAM, VACUUM AND HYDRAULIC SPECIALTIES.	
William Craig	New York.
SHIP BUILDERS.	
American Steel Barge Co.	West Superior, Wis.
Craig Ship Building Co.	Toledo, O.
Chicago Ship Building Co.	Chicago.
Detroit Dry Dock Co.	Detroit.
Newport News Ship Building & Dry Dock Co.	Newport News, Va.
Cleveland Ship Building Co.	Cleveland.
Globe Iron Works Co.	Cleveland.
Union Dry Dock Co.	Buffalo.
STOCKLESS ANCHORS.	
Baldt Anchor Co.	Chester, Pa.
International Anchor Co.	Cleveland.
STEERING ENGINES.	
Pawling & Harnischfeger	Milwaukee.
Sheriffs Mfg. Co.	Milwaukee.
Chase Machine Co.	Cleveland.
Globe Iron Works Co.	Cleveland.
Williamson Bros.	Philadelphia.
Queen City Engineering Co.	Buffalo.
Hyde Windlass Co.	Bath, Me.
STEAM HAMMERS, RIVETING MACHINES.	
Bement, Miles & Co.	Philadelphia.
TRAPS, STEAM.	
Wm. S. Haines Co.	Philadelphia.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.	
Bement, Miles & Co.	Philadelphia.
Chicago Pneumatic Tool Co.	Chicago.
TOWING MACHINES.	
American Ship Windlass Co.	Providence, R. I.
TOWING COMPANIES.	
Barry Bros. Independent Tug Line	Chicago.
Escanaba Towing & Wrecking Co.	Escanaba, Mich.
The Vessel Owners' Towing Co.	Cleveland.
TUBING, COPPER AND BRASS.	
Randolph & Clowes	Waterbury, Conn.
VALVES.	
Crosby Steam Gauge & Valve Co.	Boston.
Jenkins Bros.	New York.
G. M. Davis Co.	Chicago.
Foster Engineering Co.	Newark, N. J.
VESSEL AND FREIGHT AGENTS.	
Brown & Co.	Buffalo.
J. H. Bartow	Cleveland.
Drake & Maytham	Buffalo.
C. W. Elphicke & Co.	Chicago.
John Gordon & Co.	Buffalo.
Hawgood & Moore	Cleveland.
Hutchinson & Co.	Cleveland.
C. R. Jones & Co.	Cleveland.
Mitchell & Co.	Cleveland.
W. C. Richardson	Cleveland.
WIRE ROPE.	
John A. Roebling's Sons Co.	New York and Cleveland.
Upson-Walton Co.	Cleveland.
H. H. Baker & Co.	Buffalo.
Phosphor Bronze Smelting Co., Ltd.	Philadelphia.
WHISTLES, STEAM.	
Crosby Steam Gauge & Valve Co.	Boston.
WINDLASSES.	
American Ship Windlass Co.	Providence, R. I.
Hyde Windlass Co.	Bath, Me.
Globe Iron Works Co.	Cleveland.
WINCHES.	
American Ship Windlass Co.	Providence, R. I.
WRECKING AND SALVAGE COMPANIES.	
Escanaba Towing & Wrecking Co.	Escanaba, Mich.
Donnelly Salvage & Wrecking Co.	Kingston, Ont.
Swain Wrecking Co.	Detroit.
Vessel Owners' Towing Co.	Cleveland.
YACHT BOILERS.	
Detroit Screw Works	Detroit.
YACHT PLUMBERS.	
Alfred B. Sands & Son	New York.
YACHT AND BOAT BUILDERS.	
Thos. Drein & Son	Wilmington, Del.
Gas Engine & Power Co.	New York.
YACHT, BOAT AND CANOE HARDWARE.	
L. W. Ferdinand & Co.	Boston.
YAWLS.	
Thos. Drein & Son	Wilmington, Del.

Alphabetical List of Marine Review Advertisers.

The star (*) indicates that the advertisement appears alternate weeks.

Almy Water Tube Boiler Co.	22	Detroit Sheet Metal & Brass Works	19	Kahnweiler, D.	22	Port Royal Dock Co.	5
American Blower Co.	28	Detroit & Cleveland Navigation Co.	27	Katzenstein, L. & Co.	23	Porter's, Wm., Sons	19
American Ship Windlass Co.	2	Dixon, Jos., Crucible Co.	21	Keith, J. G. & Co.	18	Queen City Engineering Co.	22
American Steel Barge Co.	7	Donnelly Salvage & Wrecking Co.	7	Kling Bros., Chicago	22	Randolph & Clowes	1
Armstrong Cork Co.	28	Drake & Maytham	4	Lackawanna-Green Bay Line	4	Richardson, W. C.	4
Babcock & Wilcox Co.	7	Drein, Thos. & Son	19	L. S. & M. S. Ry.	27	Richardson, O. S., Fueling Co.	8
Baldt Anchor Co.	20	Dry Dock Engine Works	3	*Lake Carriers' Oil Co.	20	Roberts Safety Water Tube Boiler	19
Barry Bros. Independent Tug Line	7	Elphicke, C. W. & Co.	4	La Salle & Co.	18	Co.	19
Baker, Howard H. & Co.	21	Eophone Co.	5	*Learmonth, Robert	24	*Roebling's, John A., Sons Co.	28
Bartow, J. H.	4	Escanaba Towing & Wrecking Co.	19	Lidgerwood Mfg. Co.	5	Rochester & Pittsburgh Coal & Iron Co.	19
Bement, Miles & Co.	22	Farrar & Trefts	27	McGillis & Co., W. A.	8	Safety Car Heating & Lighting Co.	20
Berlin Iron Bridge Co.	22	Farasey & Marron	23	McKay, James & Co.	18	Sands, Alfred B. & Son	22
Bessemer Steamship Co.	18	Ferdinand, L. W. & Co.	21	McLeod, D.	4	Scott, W. L. Co.	6
Bethlehem Iron Co.	6	Fletcher, W. & A. Co.	28	McMyler Mfg. Co.	23	Sheriffs Mfg. Co.	22
Blake, Geo. F., Mfg. Co.	1	Foster Engineering Co.	5	Mackinnon Mfg. Co.	22	Shelby Steel Tube Co.	5
*Bliss, John & Co.	24	Frontier Iron Works	6	Magnolia Metal Co.	1	Ship Owners' Dry Dock Co.	28
Bloomsburg, H. & Co.	7	Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated	20	Manhattan Rubber Mfg. Co.	18	Smith, Stanley B. & Co.	8
Brown & Co.	18	General Electric Co.	6	Marine Iron Co.	23	Standard Oil Co.	24
Brown & Co.	4	Gilchrist, Albert J.	4	Martin-Barriss Co.	21	Standard Brass Works	18
Brown Hoisting & Conveying Machine Co.	2	Globe Iron Works Co.	1	Miller, Walter	20	Standard Automatic Releasing Hook Co.	23
Brown, Harvey L.	4	Goulder, Harvey D.	4	Monroe, Wm. M.	4	Sturtevant, B. F. Co.	28
Carr, J. B. Co.	21	Gordon, John & Co.	4	Milwaukee Dry Dock Co.	23	Swain Wrecking Co.	23
Castner, Curran & Bullitt	27	Graham, James & Co.	5	Mitchell & Co.	4	Trout, H. G.	21
*Chesterton, A. W. & Co.	20	Haines, Wm. S. & Co.	8	Morse, A. J. & Son	22	Tucker, C. H.	4
*Chadburn & Sons	28	Hanna, M. A. & Co.	19	Newport News Ship Building & Dry Dock Co.	18	U. S. Metallic Packing Co.	21
Chase Machine Co.	5	Hanlon, Mark H.	5	New York, Chicago & St. Louis Ry.	24	Union Dry Dock Co.	2
Chicago Pneumatic Tool Co.	20	Haug, John	4	Northern Steamship Co.	4	Upson-Walton Co.	28
Chicago Ship Building Co.	2	Hawgood & Moore	4	Ohio Supply Co.	21	Vessel Owners' Towing Co.	27
Cleveland City Forge & Iron Co.	7	Hayden, P., S. H. Co.	19	Oldham, J. R.	4	Warren & Co.	18
Cleveland Ship Building Co.	1	Herriman, F. D.	18	Ogdensburg Transit Co.	4	Wells Light Mfg. Co.	6
Cleveland & Buffalo Transit Co.	27	Hodge, S. F. & Co.	7	Page Bros. & Co.	23	White, Johnson, McCaslin & Cannon	4
C. C. C. & St. L. Ry.	27	Hoyt, Dustin & Kelley	4	Parker & Millen	18	Williamson Bros.	20
Continental Iron Works	2	Hutchinson & Co.	4	Pawling & Harnischfeger	22	Wilson, Thomas	4
Coryell, Miers	4	Hyde Windlass Co.	28	Peck, Chas. E. & W. F.	18	Wood, W. J.	4
Cory, Chas. & Son	22	Insurance Co. of North America	18	Peerless Rubber Mfg. Co.	8	Worthington, Henry R.	2
*Craig Ship Building Co.	24	International Anchor Co.	21	Phosphor Bronze Smelting Co., Ltd.	8	Youghiogheny River Coal Co.	18
Craig, William	20	Jackson & Church	23	Pickands, Mather & Co.	21	Youghiogheny & Lehigh Coal Co.	19
Crosby Steam Gauge & Valve Co.	8	Jenkins Brothers	8-22	Pinney, Orestes C.	4		
Cuddy-Mullen Coal Co.	6	Johns, H. W. Mfg. Co.	1	Pittsburgh & Chicago Gas Coal Co.	19		
Curr, Robert	4	Johnson & Higgins	6	Powell, Ambrose V.	4		
Detroit Dry Dock Co.	1	Jones, C. R. & Co.	4				
Detroit Screw Works	19						

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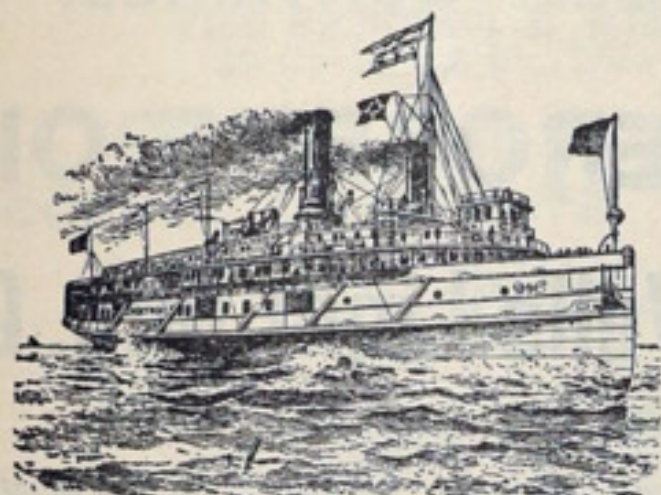
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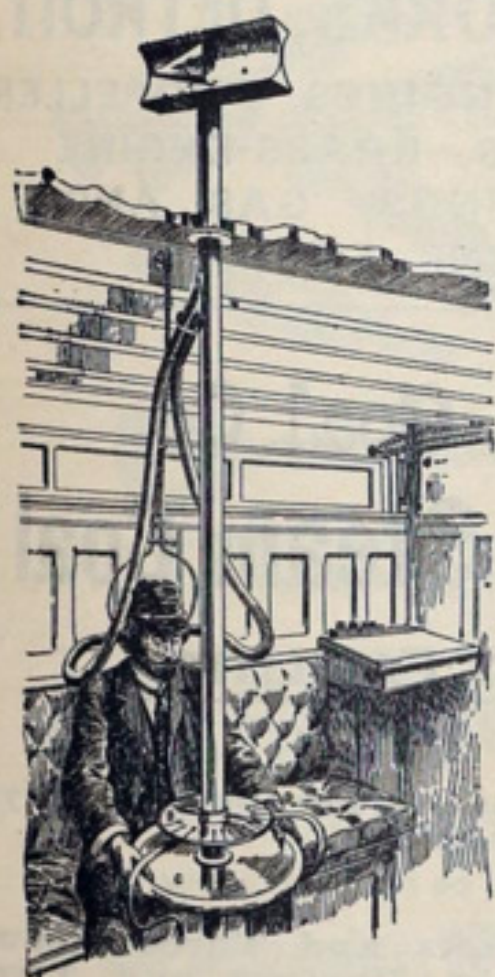
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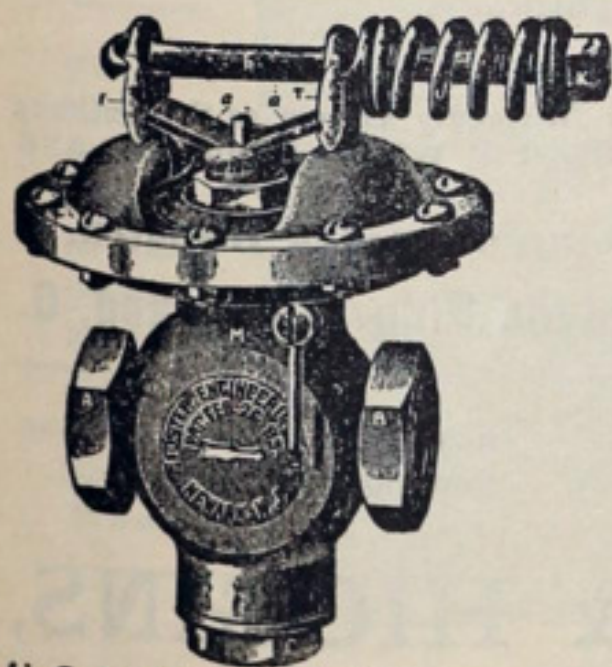
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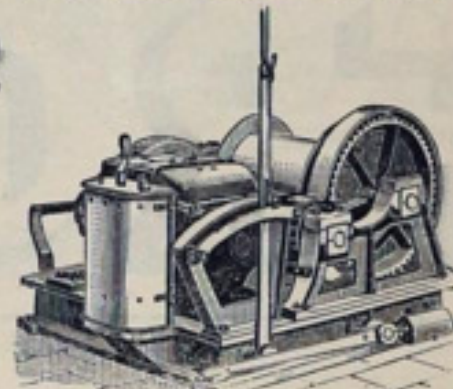
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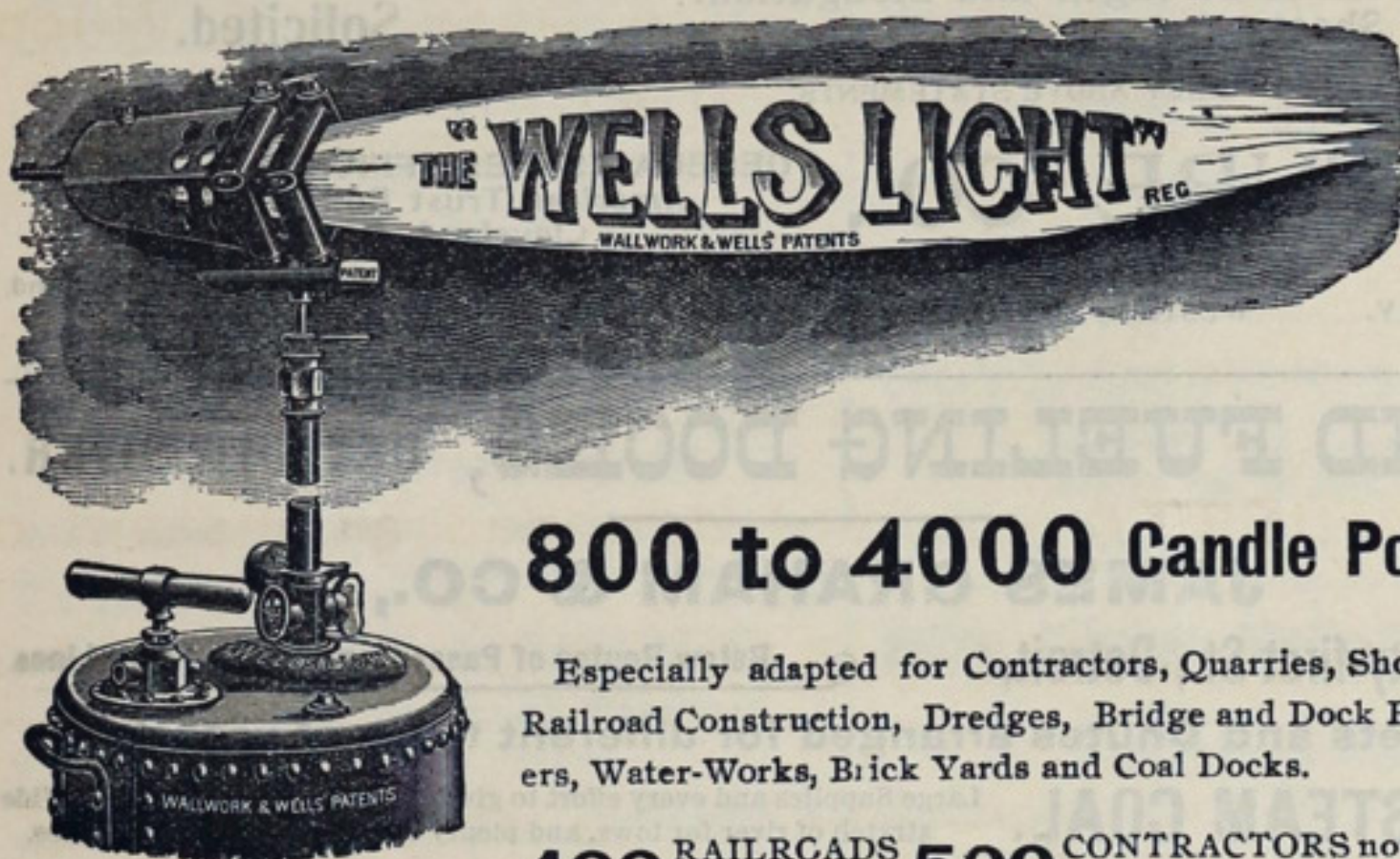
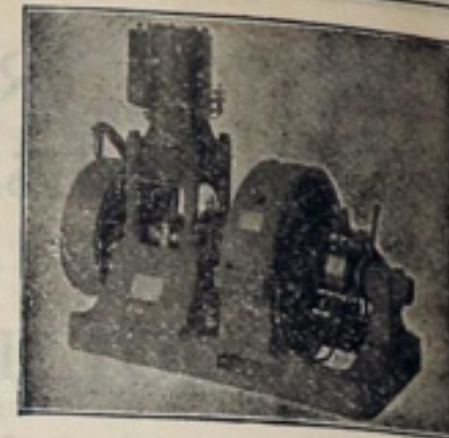
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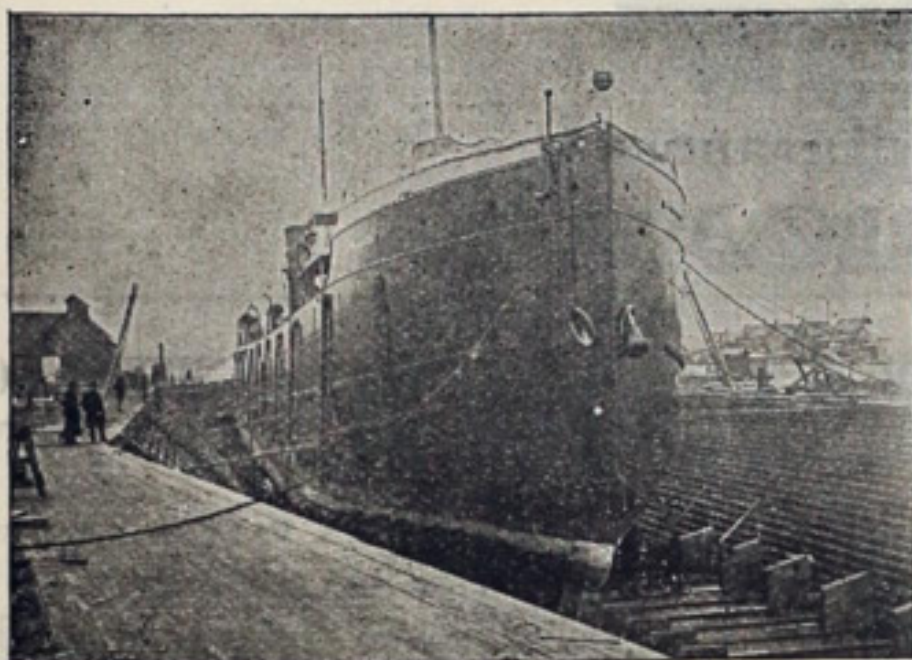


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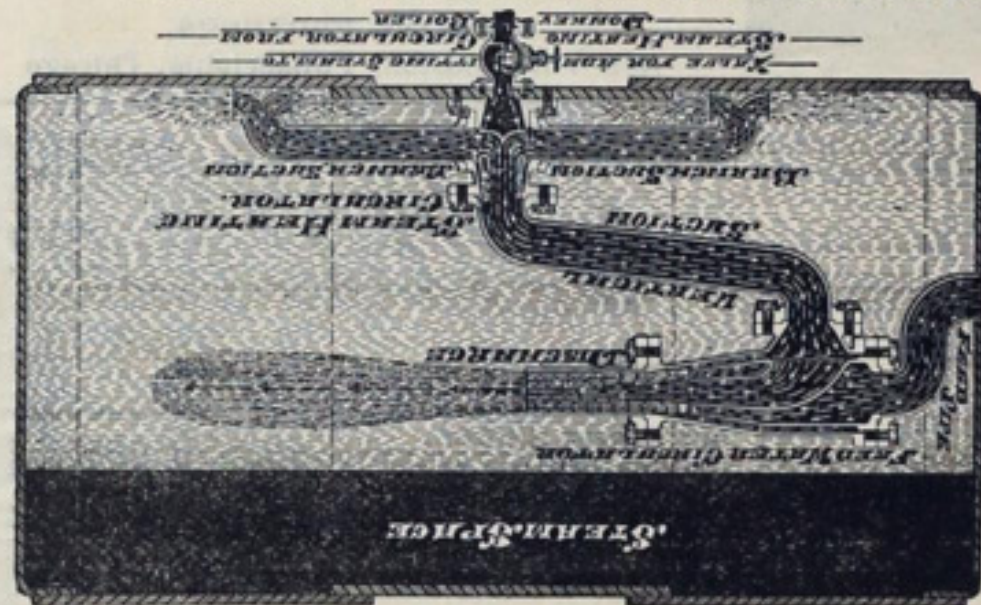
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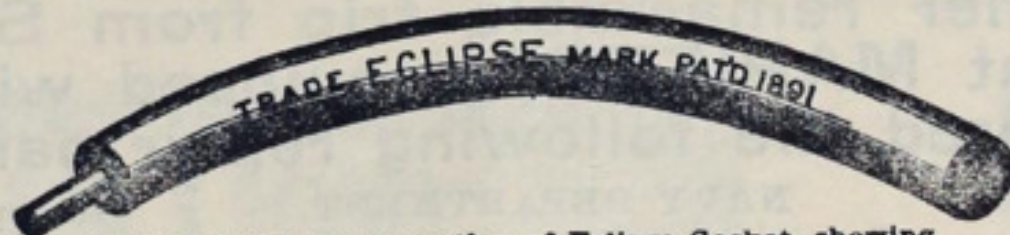


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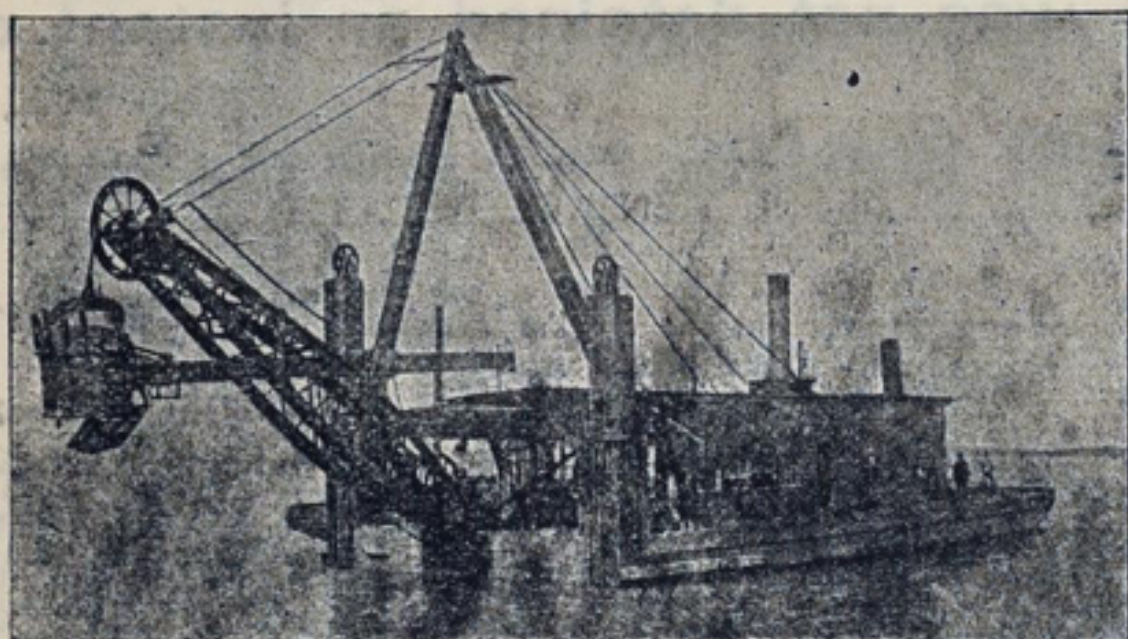
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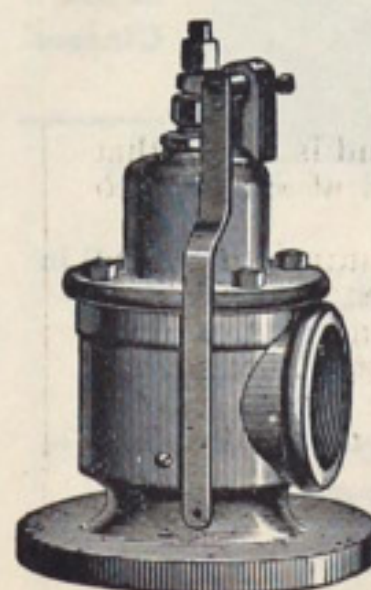
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